# RECREATION BEHAVIOR IN THE HARDING DITCH DRAINAGE AREA:

East St. Louis, Illinois and Vicinity

Prepared for:

U.S. Army Corps of Engineers
St. Louis District
St. Louis, Missouri 63101

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## East St. Louis, Illinois and Vicinity

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by

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Foreword:

The purpose of this report is to describe the outdoor recreation patterns of residents in or near the Harding Ditch Drainage Area, of East St. Louis, Illinois and vicinity. Twenty three different outdoor activity patterns are described and, when possible, comparisons of household demands for recreation are made with regard to other urban areas of Madison and St. Clair Counties, and the overall pattern of Illinois' households.

The first section of this report presents a very general model of recreation behavior and a detailed explanation of the household demand survey undertaken for the Illinois Department of Conservation. The purpose of the Department of Conservation Study was to estimate household demand for outdoor recreation activities for 1975 through 1995 at five year intervals. The results of the recreation forecasts were used to develop public policies and planning guidelines for a Statewide Comprehensive Outdoor Recreation Plan for funding under the Land and Water Conservation Act administered by the U.S. Bureau of Outdoor Recreation. Included here are descriptions of the sampling methodology and the supply inventory characteristics gathered for public and private recreation facilities in Illinois. A specific description of the exact measures used in analyzing household demand and the supply of recreation facilities is also presented.

The next section presents information which describes the various study areas used in the Harding Drainage Area Analysis including sample sizes, estimates of the Base Data (participation) for each area sampled and a description of the methodology used in projecting household demand. Also included here are comparisons of sample areas for demographic characteristics plus a description of distance and travel time patterns in recreation consumption.

The third section compares patterns of interlocking activities for the Harding Ditch study area, the urban areas of Madison and St. Clair Counties, two governor's regions of Illinois, and the overall pattern for the state.

The fourth section of this report describes a set of multiple regression analyses which attempt to uncover the demographic and supply features of recreation destinations which are the best predictors of household demand.

The fifth and final section of this report is speculative in nature. It contains a discussion of outstanding problems related to recreation planning and a list of recommendations for recreation resource development in the vicinity of Harding Ditch Drainage study area.

Stanley R. Lieber,
January, 1978

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# FORECASTING THE RECREATION BEHAVIOR OF ILLINOIS RESIDENTS

## INTRODUCTION

Recreation behavior is different from other types of behavior which require movement from origins to destinations, like the journey to work, because each household's choices of recreation activities in which to participate and where this participation will take place are discretionary choices. The model of recreation choice (Figure 1) used in this analysis assumes that the choice of a place in which to participate in an outdoor recreation activity is primarily affected by the decision makers' or households' social, economic and demographic characteristics, the supply of appropriate facilities and the relative locations of each type of place at which the decision maker can participate in an outdoor recreation activity. For example, a household characteristic such as the number of children less than two years of age may influence the type of recreation activities that a family participates in and the frequency of their participation. One would expect that households having an infant or a very young child might not make extensive sailboating trips or undertake similar strenuous activities (1).

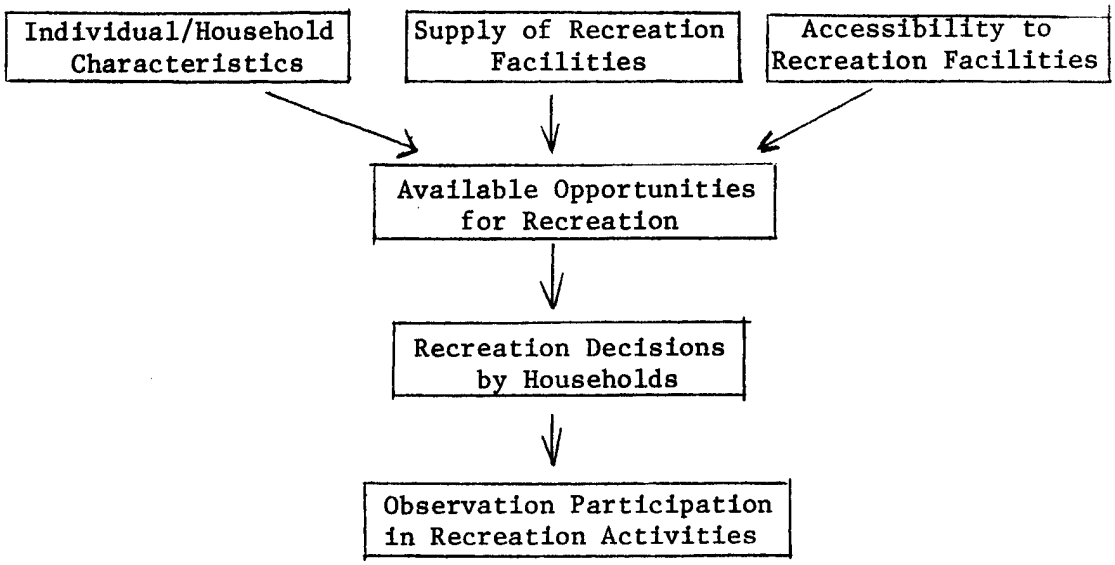
In addition to age, sex and family composition characteristics, another type of family characteristic which may influence household recreation decisions is the nature of the social relationships of the family. Camping in organized groups may be a social occasion as much as an outdoor experience. Motorboating may be participated in because it brings people together in a leisurely social

atmosphere. These examples illustrate how demographic, economic and social characteristics may be related to each other, often in complex ways, in influencing each household's participation in outdoor recreation (2).

In addition to these household characteristics, another type of consideration may influence participation in outdoor recreation activities. First, and probably most important, is the quantity (size) of facilities and the types (variety) of outdoor activities which can be participated in at each alternative location. For each alternative recreation facility, the quantity of supply is believed to influence the frequency of household participation in a given recreation activity (3). Up to a point, for an activity, larger facilities provide opportunities for more varied participation. Clearly, larger facilities may be considered by households as providing more alternative sites or areas for recreation participation or multiple-activity recreation if any single site or area within a recreation facility is heavily utilized. If neither crowding nor multiple purpose recreation trips were important to households and if such conditions were unrelated to the frequency of participation in outdoor recreation activities, we would always expect recreators to patronize the nearest facility. If the size and variety of facilities were irrelevant to an analysis of participation, one would expect people to participate in recreation activities based upon socioeconomic characteristics alone. That people go to several alternative locations for recreation participation, indicates that differences among alternative locations exist and that the quantity of features available at each location has an influence upon the frequency of participation and the destination chosen.

The second geographic factor influencing recreation participation may act to equalize competition between large and small recreation areas. This

FIGURE ONE: MODEL OF RECREATION CHOICE



"equalizer" is the pattern of relative accessibility of households to outdoor recreation supply, i.e., the distribution of population relative to the locations of recreation facilities. For example, a person who wants to go hiking may be confronted by a problem. One hiking area is very large and attractive but far from his home, while another is much smaller but is closer to his residence. This individual has to evaluate the enjoyment to be gained by going to a larger site against the extra cost, travel time and effort incurred in traveling to a more distant site. Additionally, while our hiker may be choosing between a large site which is far away and a smaller one close by, a second potential hiker living in a different location (and, therefore, located with regard to the same facilities in a different manner) may have no effective choice at all. He may be so far from either of the two facilities size such that he may decide that it is better to forego any participation. And, a third hiker may be located relative to these same two facilities such that he is very close to the larger of the two and far away from the smaller one. In these three choice situations we could assume that the desire to hike was about the same for each participant. Thus, any variation in the frequency of participation by the individuals would have to be due to the relative location of each household vis-a-vis the distribution of alternative recreation facilities.

In summary, the major types of characteristics which determine recreation behavior patterns, and which can be used to estimate future participation in recreation activities fall in three general categories:

1) social, demographic, and economic characteristics of households,

2) features which characterize the recreation sites patronized by households in terms of the quantity of supply available to recreators, and

3) characteristics which measure the relative accessibility of households to places where recreation experiences are engaged in.

## HOUSEHOLD SURVEY

Because the forecasting techniques and the explanatory framework for recreation behavior are both based on information about household behavior, a survey was conducted to obtain a sufficiently large and reliable data base from which household behavior could be predicted. First, a household survey was conducted in which 10,389 households, comprising 28,917 persons, were enumerated. Of these, 9,238 households, comprising 25,901 persons were in Illinois; 2,639 households comprising 7,940 persons were enumerated in the Chicago area; 6,599 households comprising 17,960 persons were enumerated in the rest of the state. The remaining 1,151 households comprising 3,016 persons were selected from populous counties of those states bordering Illinois, viz., Iowa, Missouri, Wisconsin, Indiana and Kentucky, so that information could be obtained on which type of activities are participated in by out-of-staters in Illinois and how frequently they participate in these activities. Tables 1, 2, and 3 show the number of telephone contacts attempted and completed, the number of completed interviews by Governor's Region and the percentage of error of values derived with regard to each region's total population, and the total number of people surveyed in each Governor's Region. Figure 2 shows the number of interviews completed on a county by county basis for each Governor's Region.

The size of the sample gathered for each Governor's Planning Region made it highly likely that the responses of the sample would be no more than three percent different than if the entire population in each Governor's Region were

TABLE 1: Number of telephone exchanges, number of calls attempted, number of attempts per exchange and number of completed interview by telephone area code.

| REGION AND AREA CODE | Number of Exchanges | Number of Attempts | Attempts Per Exchange | Completed Interviews |
|---|---|---|---|---|
| CHICAGO REGION | | | | |
| AREA CODE 312 | 524 | 10867 | 20.7 | 2255 |
| DOWNSTATE ILLINOIS | | | | |
| AREA CODE 217 | 306 | 16263 | 53.1 | 1740 |
| AREA CODE 309 | 226 | 11980 | 53.0 | 1502 |
| AREA CODE 618 | 291 | 15434 | 53.0 | 1962 |
| AREA CODE 815 | 245 | 13014 | 53.1 | 1792 |
| TOTAL | 1068 | 56691 | 53.1 | 6996 |
| OUTSIDE ILLINOIS | | | | |
| INDIANA (219, 812) | 81 | 1691 | 20.9 | 319 |
| IOWA (319) | 54 | 1156 | 21.4 | 182 |
| KENTUCKY (502) | 7 | 148 | 21.1 | 27 |
| MISSOURI (816, 314) | 120 | 2541 | 21.2 | 502 |
| WISCONSIN (608, 414) | 33 | 671 | 20.3 | 121 |
| TOTAL | 295 | 6207 | 21.0 | 1151 |
| TOTAL | 1887 | 73765 | ---- | 10402* |

*This total varies from other totals because of miscoded and uncoded area codes which are not included in this tabulation.

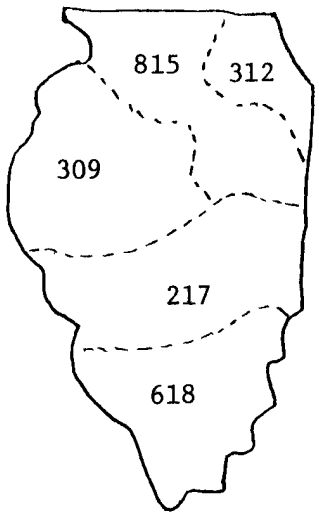


TABLE 2: Number of completed interviewes and confidence interval for estimates of proportions by Goveronrs Planning Region in Illinois and by State.

| ILLINOIS | COMPLETED INTERVIEWS | CONFIDENCE INTERVAL* |
|---|---|---|
| REGION 1A | 902 | ±.033 |
| REGION 1B | 1729 | ±.024 |
| REGION 2 | 2639 | ±.020** |
| REGION 3A | 1266 | ±.028 |
| REGION 3B | 989 | ±.032 |
| REGION 4 | 713 | ±.037 |
| REGION 5 | 1229 | ±.029 |
| TOTAL | 9238 | ±.015** |
| OUTSIDE ILLINOIS | | |
| INDIANA | 319 | ±.056 |
| IOWA | 182 | ±.074 |
| KENTUCKY | 27 | ±.192 |
| MISSOURI | 502 | ±.045 |
| WISCONSIN | 121 | ±.091 |
| TOTAL | 1151 | ±.029 |

*Twice the upper limit on the standard error of a proportion estimated from the given sample size

**Assumes the proportion has been estimated using the weighting scheme discussed in the text of this report

TABLE 3: The Population Sample Sizes by Governor's Regions of Illinois for Household Survey of Demand.

| REGION | SAMPLE SIZE | NO. HOUSEHOLDS |
|---|---|---|
| 1A | 2592 | 902 |
| 1B | 4203 | 1729 |
| 2 | 7940 | 2639 |
| 3A | 2627 | 1266 |
| 3B | 3469 | 989 |
| 4 | 2399 | 713 |
| 5 | 2671 | 1229 |
| TOTAL | 25,901 | 9238 |
| INDIANA | 815 | 319 |
| IOWA | 513 | 182 |
| KENTUCKY | 63 | 27 |
| MISSOURI | 1283 | 502 |
| WISCONSIN | 342 | 121 |
| TOTAL | 3016 | 1151 |

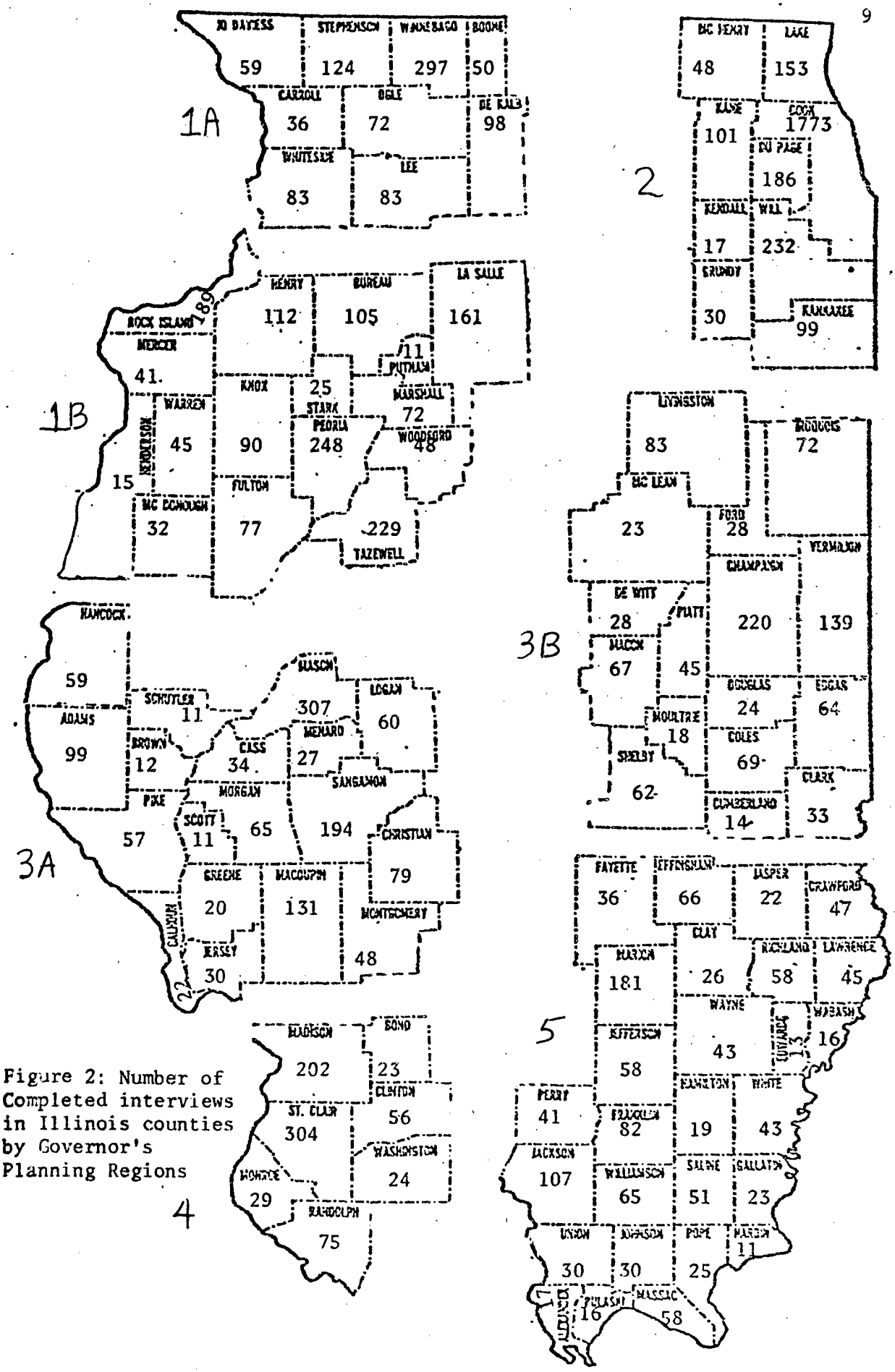



Figure 2: Number of Completed interviews in Illinois counties by Governor's Planning Regions

interviewed and no more than one percent different from the statewide results if the entire population of Illinois were interviewed. To achieve these small margins of error, one must have a representative sample of data. Utilizing a random digit dialing procedure for all the area codes and telephone exchanges within Illinois and the out-of-state counties to be sampled, more than 70,000 phone calls were made in order to obtain slightly over 10,000 completed interviews. The survey group had seven phones in operation eighty hours per week and the telephone interviews were monitored by two supervisory personnel to insure consistency in the quality of the interviews. Although the interviews averaged twenty minutes in length there were surprisingly few hangups and disconnections during an interview (about 2 percent) and the questions asked and the topic of the survey may have had much to do with this low rate. All data were coded onto computer sheets which were optically scanned, thus bypassing the need to keypunch the data. Besides adding convenience to the survey the optical scanning of coded data eliminates computer keypunching error. A wide range of information was obtained through the survey and although only some of the information is used in the analyses presented here, the large samples obtained through the survey maintain a large degree of flexibility for further data analysis. The household interview questionnaire is attached in Appendix A.

## SUPPLY INVENTORY

Simultaneously, with the household survey an inventory of public and privately owned recreation facilities open to the public in Illinois was conducted to obtain information on the quantity and types of facilities present in the State. The first phase of the inventory consisted of identifying

relevant supply information, developing a suitable questionnaire for obtaining this information and mailing the questionnaire to all federal, state, county and local governmental agencies which either owned or managed recreation properties. One hundred and twenty-five different supply characteristics for each facility were elicited by the survey questionnaire. These characteristics ranged from the number of minimally developed campsites in a recreation area to the number of totally developed acres at the recreation facility and the number of feet of hiking trails present in the recreation facilty. The characteristics chosen for inclusion of the survey were those which were easily quantifiable and likely to be available from the various governmental units. A copy of the questionnaire is to be found in Appendix B. Please note that the first page identifies all land parcels which are inventoried for a given questionnaire.

A one hundred percent complete return was obtained for all federally owned and administered lands in Illinois including those of the U.S. Forest Service, U.S. Army Corps of Engineers, the Fish and Wildlife Service, and the National Park Service. At the state level all lands owned or managed by the Illinois Department of Conservation were inventoried with the exception of one facility which is currently being inventoried. Data were obtained through the regional coordinators of the Department of Conservation or through site supervisors of facilities. Conservancy, forest preserve, and river conservancy districts were mailed questionnaires and followup telephone interviews helped the investigators to obtain a complete survey of facilities. With regard to local municipal recreation, over ninety percent of all park districts who are members of the Illinois Association of Park Districts returned completed questionnaires. Of the sixty cities in Illinois over 25,000 population, forty-nine returned completed inventories. Of the remaining eleven, several had no information to

report because they didn't own or manage land. We believe that our information comprises almost a one hundred percent inventory of supply information for cities over 25,000 population. Additionally, questionnaires were mailed to all cities over 5,000 in population but only one mailing was attempted because of budget allocations. An additional questionnaire mailing was directed at private and quasi-public facilities and sources of information included the Soil Conservation Service Inventory, data from the Department of Public Health, publicly and privately published directories (such as the Woodall Directory of Trailering Parks and Campgrounds), and information published by the Illinois Department of Business and Economic Development and the Yellow Pages. As a result of the survey, federal and state inventories are ninety-nine to one hundred percent complete; municipal and park district data, conservancy district data, etc., are about ninety-five percent complete and private facilities yielded a return of twenty percent of the questionnaires. As a cautionary note, we wish to say that while twenty percent of the private and quasi-private facilities responded with questionnaires, we cannot determine exactly the proportion of total investments or facilities involved. We feel that this information probably represents more than 20 percent of all privately owned recreation supply, because most of these sites were open year-round rather than for only part of a year. The inventory was conducted from September 1976 to January of 1977 and we believe that year-round establishments which were surveyed during the late fall and winter seasons represent large monetary investments in facilities and are likely to be among the more extensive and largest privately owned facilities. More than 2,500 individual parcels of land were inventoried and catalogued and data was computerized by location (town, county, Governor's Region) and by type of ownership (federal,

state, local, etc.). The inventory of 2,512 land parcels was developed from more than seven hundred returned questionnaires.

## DATA COLLECTED

Twenty-three recreation activities formed the basis of our investigation of recreation behavior. These activities were:

1) Canoeing on Rivers and Streams,
2) Canoeing on Lakes and Ponds,
3) Sailing on Lake Michigan,
4) Sailing Other Than Lake Michigan,
5) Motorboating with 10 Horsepower or Less,
6) Motorboating on Lake Michigan,
7) Motorboating with 10 Horsepower or More,
8) Day Hiking,
9) Overnight Hiking,
10) Camping with an Organized Group,
11) Camping Enroute,
12) Primitive Camping,
13) Camping That You Can Drive Into,
14) Bicycling,
15) Horseback Riding,
16) Snowmobiling,
17) Off-Road Motorcycling,
18) Off-Road Driving,
19) Swimming at Lake Michigan,
20) Swimming Other Than Lake Michigan,
21) Swimming at Pools,
22) Lodging With Kitchen Facilities, and
23) Lodging Without Kitchen Facilities.

These twenty-three activities related to the potentially largest areas of capital outlay in Department of Conservation planning. The exact definition of what constitutes each of the activities is specified in each of the activity sections detailing the supply and demand forecasting information.

## CHARACTERISTICS MEASURED

The three general sets of characteristics which affect household

participation in outdoor activities have been previously described. For all ensuing analysis, participation in an outdoor recreation activity is measured in terms of activity days. For each activity done by households, the average number of household members who took part in the activity was estimated as was the number of times (days) that the activity was undertaken. The number of activity days, therefore, that a household spent in an activity was measured by multiplying the number of days of participation times the average number of people who participated. For each outdoor activity, this information was elicited for as many as the five most patronized recreation facilities (e.g., parks, areas). Additionally, prior to the gathering of such information for specific destination, an overall estimate of activity days was obtained for the households' previous twelve months of activities. In essence then, the elicitation of destination specific activity day figures acted as a means of checking the household's overall yearly estimate of reported participation behavior. For each outdoor activity, the sum of all the activity day estimates for specific parks or recreation areas should have added up to the total twelve-month estimate. Households participating in this survey averaged between three and four activities for the number of recreation activities in which all those surveyed participated and the sum of the activity day estimates of the two most frequented parks or areas accounted for about ninety percent of a household's participation in any activity. Of course, a few households went to many more areas or parks and some were even able to recall the names of all the places that they frequented more than once for an activity. For the compilation of origin to destination patterns of activity days for 1976 and the projection years of 1980, 1985, 1990, and 1995, all totals of activity days reflected the information reported by each household

for each activity for up to five recreation areas or parks. However, because of the sheer size of the information recorded and the data management problems involved, subsequent reports for regression analyses (those which describe characteristics relating to participation on an activity-by-activity basis) utilize information for only the two most patronized recreation areas.

Individual/Household Characteristics (4)

The following is a list of the household demographic characteristics utilized in this research:

1) the percentage of male members in a household,
2) the average age of the household members,
3) the number of children between zero and two years old,
4) the number of children between three and five years old,
5) the number of children between six and twelve years old,
6) the number of children between thirteen and seventeen years old,
7) the education level of the head of the household,
8) the annual income of the household,
9) the length of residence of the household at their present address,
10) the length of residence of the household within the present town of residence,
11) the size of the town within which the household head lived as a child,
12) the number of workdays in a week for the head of the household,
13) the number of workhours in a week for the head of the household,
14) the number of days of paid vacation in a year for the head of the household,
15) whether or not the household had participated in each of the outdoor recreation activities five years ago, i.e., during 1971.

The first characteristic, the percentage of males in the household, acts as a sex ratio and was included because we believe that the more strenuous recreation activities would be done by those households which were predominantly male. Further, we included age-category characteristics for children which we believe are related to mobility. We think that the presence of children and their ages affects the degree to which certain activities such as boating, camping, and hiking can be enjoyed. We argue that the presence of infants

severely limits the frequency with which households can participate in certain activities. Parents are unlikely to engage in backpacking or overnight hiking with very small infants. While children aged three to five are mobile, their stamina is suspect and is likely to affect the types of and frequency with which households engage in certain activities. In essence, the age categories utilized here are believed to represent a continuum of increasing mobility and stamina which we believe will relate to the frequency with which households participate in activities. Education is often suggested as an important discriminatory characteristic affecting the type of activity engaged in by households and is measured by the number of school years completed by the head of the household. Length of residence characteristics are believed to indicate the familiarity of the household with the environment and we presumed to be related to highly localized recreation patterns of participation. All length of residence characteristics are measured to the nearest half year. Income is a standard predictor of the frequency with which households participate in outdoor activities and was measured in increments of $2,000, e.g., $4,000-$5,999; $6,000-$7,999; $8,000-$9,999, etc. The size of town that people grew up in was coded in the following manner: In a large city (250,000 +); in a suburb near a large city; in a medium sized city (50,000 - 250,000); in a small city or town (under 50,000); on a farm or ranch; in open country but not on a farm. Whether or not a household had participated in an activity during 1971 was coded dichotomously ("yes" or "no"). Lastly, households were asked if they had participated in the same activities during 1971 more frequently, less frequently or with about the same frequency as they had participated in the activity in 1976 and these data were coded into three categories ("more", "same", or "less").

Supply Characteristics

Although as many as one hundred recreation characteristics were measured for recreation facilities, less than twenty-five were chosen for inclusion in the analyses. Those characteristics of recreation facilities which were included here hypothesized to relate most closely with the frequency of household participation in outdoor activities. For every activity that each household participated in the following information was recorded for the two most frequently patronized sites:

1) the total number of acres,
2) the number of developed acres,
3) the number of developed campsites,
4) the number of picnic areas,
5) the number of beaches,
6) the number of swimming pools,
7) the number of lakes,
8) lake surface acreage,
9) the number of unrestricted lakes,
10) the surface acreage of unrestricted lakes and waters,
11) whether or not sailboating was permitted,
12) the number of launches,
13) the number of mooring slips,
14) the number of outdoor recreational off-road vehicle trails,
15) the number of backpacking trails,
16) the number of horseback riding trails,
17) the number of nature trails,
18) the number of lodge units, and
19) the number of cabin units.

We also calculated the following information: a variety index for each recreation facility and an index of multiple purpose use for a recreation site. The variety index can range between zero and one. If facilities for all twenty-three outdoor recreation activities are provided as a park or recreation area, then the recreation area is rated at 23/23 or one. If facilities for only one activity are provided at an area then the recreation area is rated at 1/23 or 0.043. Another set of recreation behavior predictors includes measures of the accessibility of recreation areas to each household which was surveyed. The

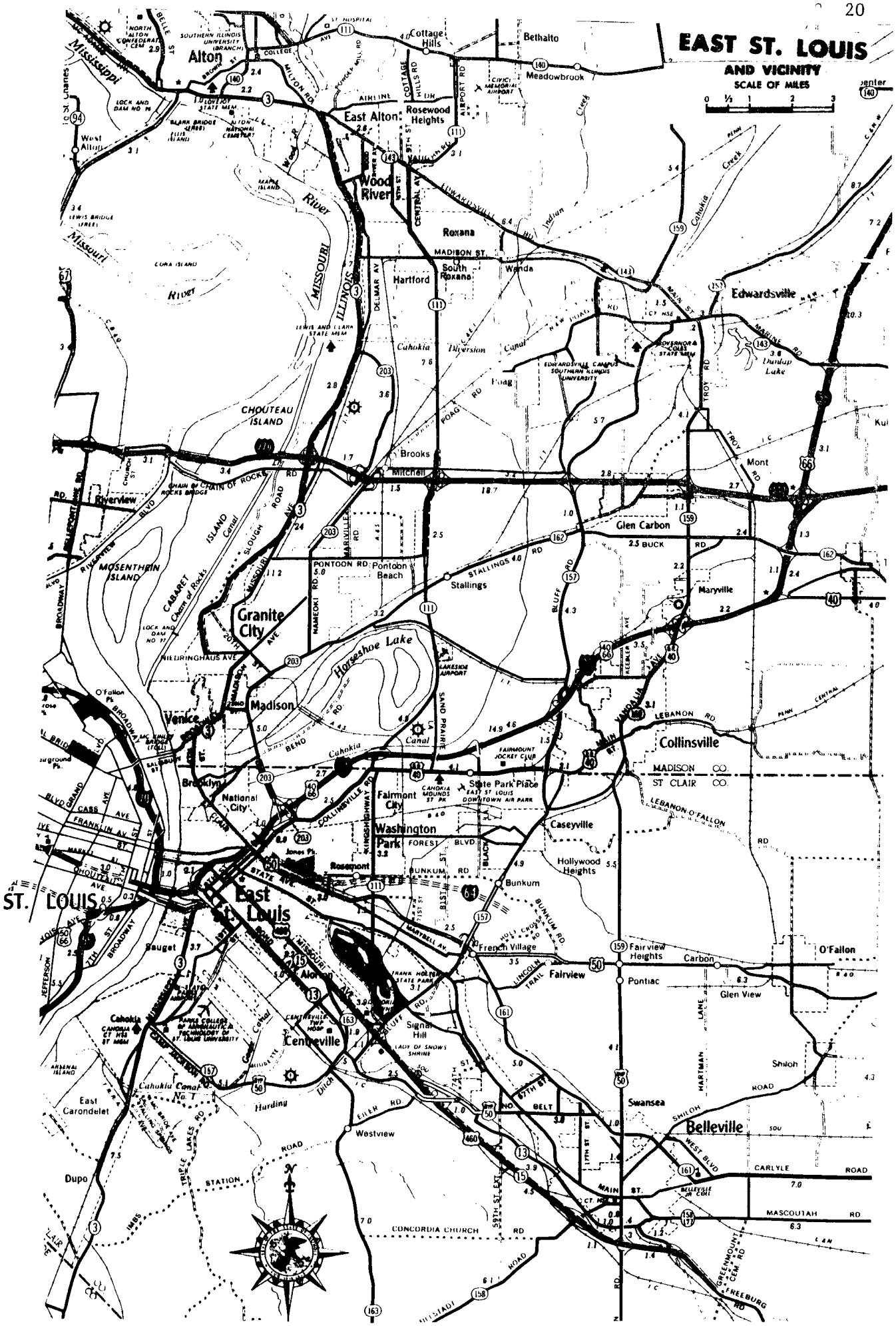
first characteristic is the household head's estimate of distance in miles to the two most frequented recreation areas for each activity. The second accessibility characteristic is the household head's estimate of travel time in minutes to the two most frequently used recreation areas for each activity participated in by the household.

Table 33 lists the best predictors of recreation participation identified by this study. Supply and household, as well as accessibility factors are listed in their order of relative importance.

## HARDING DITCH STUDY AREA

For the purposes of this research two specific study areas were defined. The principal study area (and referred to as the HDSA throughout the report) comprised the towns of East St. Louis, Alorton, Centreville, Caseyville, Fairview Heights, and Washington Park and are all located in St. Clair County; an area which is part of Governor's Region 4 in Illinois. These towns had a 1975 population of 112,156 (derived from the Official Highway Map of Illinois) and the U.S. Bureau of the Census indicated that these towns had a large non-white population component. The recreation supply area defined for this study area is represented by a line of about twelve to fourteen miles radius from East St. Louis at the Mississippi River (Figure 3).

Recreation facilities within this boundary were considered as local. All other recreation facilities were locationally coded by Governor's Region or out-of-state destination. The second study area which represents a variety of eighteen urban/suburban residential situations in Madison and St. Clair counties has a population of 316,827 people (from the 1975 Official Highway Map of Illinois). Excluding the towns of the HDSA, the remaining towns have a total population of 204,671 and are identified in Table 4. Activity day totals shown in the first column of Tables 5 through 27 are for these 204,671 urban residents of Madison and St. Clair counties. Activity day totals shown in the second column of these tables are for the residents of the HDSA. All the outdoor recreation facilities located in places or areas portrayed in Figure 3 were considered as local destinations for these urban areas of St. Clair and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AND VICINITY
SCALE OF MILES
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Bethalto
Meadowbrook
East Alton
Rosewood Heights
Wood River
Roxana
South Roxana
Hartford
Wanda
Edwardsville
Dunlap Lake
Cahokia Diversion Canal
CHOUTEAU ISLAND
Brooks
Mitchell
Mont
Glen Carbon
Riverview
MOSENTHEIN ISLAND
Pontoon Beach
Stallings
Maryville
Granite City
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Missouri River
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ILLINOIS
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Harding Ditch
Cahokia Canal No. 1

TABLE 4

STUDY AREA INFORMATION FOR HARDING DITCY STUDY AREA (1976-1977)

| Region | Completed Interviews | Household Populations | Confidence Interval |
|---|---|---|---|
| Harding Ditch Study Area[1] | 116 | 373 | ±.090 |
| Urban Areas of St. Clair and Madison Counties[2] | 436 | 1273 | ±.047 |
| Illinois Governor's Region "4" | 713 | 2399 | ±.037 |

[1]Towns include: East St. Louis, Alorton, Centreville, Caseyville, Fairview Heights, Washington Park.

[2]Towns include: Alton, Wood River, Edwardsville, Glen Carbon, Troy, Collinsville, Maryville, Granite City, Fairmont City, O'Fallon, Belleville, Cahokia.

TABLE 5

Swimming in Pools - 1976

| Destination | Urban Areas of Madison and St. Clair Counties | Harding Ditch Study Area |
|---|---|---|
| 1A | 181 | 26 |
| 1B | 0 | 120 |
| 2 | 142 | 24 |
| 3A | 316 | 27 |
| 4 | 3395 | 963 |
| 5 | 49 | 32 |
| AL | 3 | |
| ARK | 74 | 8 |
| FL | 18 | |
| GEOG | 21 | |
| IND | 4 | |
| KENT | 8 | |
| MO | 108 | 91 |
| TENN | 294 | 120 |
| HAWI | 28 | |
| E SL | 1895 | 2867 |
| SUBTOTAL | 6536 | 4278 |
| UNCLASS. | 4174 | 2083 |
| TOTAL | 10710 | 6361 |

TABLE 6

Canoeing on Rivers and Streams - 1976

| Destination | Urban Areas of Madison and St. Clair Counties | Harding Ditch Study Area |
|---|---|---|
| 2 | | |
| 4 | 2 | |
| IND | 8 | |
| KAN | 3 | |
| MICH | 28 | |
| MO | 336 | 10 |
| WISC | 6 | |
| E SL | 2 | |
| SUBTOTAL | 385 | 10 |
| UNCLASS. | 33 | 290 |
| TOTAL | 418 | 300 |

TABLE 7

Canoeing on Lakes and Ponds - 1976

| Destination | Urban Areas of Madison and St. Clair Counties | Harding Ditch Study Area |
|---|---|---|
| 3A | 20 | |
| 4 | 135 | |
| ARK | 4 | |
| IND | 16 | |
| MO | 36 | 2 |
| OK | 16 | |
| WISC | | 8 |
| E SL | 75 | |
| SUBTOTAL | 302 | 10 |
| UNCLASS. | 10 | |
| TOTAL | 312 | 10 |

TABLE 8

Sailing on Lake Michigan - 1976

| Destination | Urban Areas of Madison and St. Clair Counties | Harding Ditch Study Area |
|---|---|---|
| 2 | 4 | 8 |
| TOTAL | 4 | 8 |

TABLE 9

Sailing Except on Lake Michigan - 1976

| Destination | Urban Areas of Madison and St. Clair Counties | Harding Ditch Study Area |
|---|---|---|
| 1A | | 5 |
| 1B | 18 | |
| 4 | 3 | |
| AL | 5 | |
| FL | 35 | |
| MO | 21 | |
| TX | | 4 |
| SUBTOTAL | 82 | 9 |
| UNCLASS. | 6 | 3 |
| TOTAL | 88 | 12 |

TABLE 10

Motorboating with Ten Horsepower or Less - 1976

| Destination | Urban Areas of Madison and St. Clair Counties | Harding Ditch Study Area |
|---|---|---|
| 2 | 18 | |
| 3A | 119 | |
| 4 | 387 | 169 |
| 5 | 69 | |
| FL | 9 | |
| KENT | 48 | |
| MICH | 8 | |
| MO | 308 | 95 |
| OK | 16 | |
| TENN | 14 | |
| WISC | 6 | 2 |
| SUBTOTAL | 1002 | 266 |
| UNCLASS. | 477 | 21 |
| TOTAL | 1479 | 287 |

TABLE 11

Motorboating on Lake Michigan - 1976

| Destination | Urban Areas of Madison and St. Clair Counties | Harding Ditch Study Area |
|---|---|---|
| 2 | 57 | 4 |
| (On Lake Mich in Ind., Wisc., Mich.) | 9 | |
| TOTAL | 66 | 4 |

TABLE 12

Motorboating with Ten Horsepower or More - 1976

| Destination | Urban Areas of Madison and St. Clair Counties | Harding Ditch Study Area |
|---|---|---|
| 1A | 3 | 4 |
| 3A | 328 | |
| 3B | 55 | 18 |
| 4 | 841 | 140 |
| 5 | 310 | 385 |
| ARK | 97 | |
| FL | 128 | |
| IND | 12 | |
| IOWA | 12 | |
| KENT | 92 | |
| MICH | 56 | |
| MINN | | 24 |
| MISS | 9 | |
| MO | 467 | 338 |
| NEB | 250 | |
| OK | 12 | |
| TENN | 2 | |
| WISC | 4 | |
| E SL | 1 | |
| SUBTOTAL | 3377 | 909 |
| UNCLASS. | 1382 | 22 |
| TOTAL | 4759 | 931 |

TABLE 13

Day Hiking - 1976

| Destination | Urban Areas of Madison and St. Clair Counties | Harding Ditch Study Area |
|---|---|---|
| 1A | 4 | 75 |
| 1B | 30 | 8 |
| 3A | 493 | 86 |
| 3B | 40 | |
| 4 | 627 | 271 |
| 5 | 127 | 50 |
| ARK | 56 | |
| CO | 9 | |
| GEOG | 36 | |
| ILL | | |
| KENT | 16 | |
| MISS | 7 | |
| MO | 271 | 130 |
| NC | 10 | |
| SD | | 42 |
| TENN | 29 | 8 |
| VA | 2 | |
| WISC | 39 | 6 |
| WY | 14 | |
| E SL | 321 | 141 |
| SUBTOTAL | 2131 | 817 |
| UNCLASS. | 987 | 135 |
| TOTAL | 3118 | 952 |

TABLE 14

Overnight Camping/Hiking - 1976

| Destination | Urban Areas of Madison and St. Clair Counties | Harding Ditch Study Area |
|---|---|---|
| 1A | 6 | 3 |
| 1B | 4 | |
| 3A | 6 | |
| 4 | 68 | 30 |
| 5 | 6 | 18 |
| ILL | | |
| MICH | 7 | |
| MO | 52 | 28 |
| E SL | 2 | |
| SUBTOTAL | 151 | 79 |
| UNCLASS. | 143 | 1 |
| TOTAL | 294 | 80 |

TABLE 15

Camping with an Organized Group - 1976

| Destination | Urban Areas of Madison and St. Clair Counties | Harding Ditch Study Area |
|---|---|---|
| 2 | 27 | |
| 3A | 3 | 2 |
| 4 | 76 | |
| 5 | 11 | |
| AL | 180 | |
| FL | 36 | |
| GEOG | 180 | |
| MISS | 180 | |
| MO | 162 | 21 |
| DC | | 2 |
| E SL | 279 | 9 |
| SUBTOTAL | 1154 | 34 |
| UNCLASS. | 539 | 16 |
| TOTAL | 1693 | 50 |

TABLE 16

Camping on the Way to Somewhere Else - 1976

| Destination | Urban Areas of Madison and St. Clair Counties | Harding Ditch Study Area |
|---|---|---|
| 1B | 12 | 12 |
| 3A | 20 | |
| 3B | 6 | |
| 4 | 3 | |
| 5 | 18 | |
| ARK | 6 | 84 |
| CA | | 7 |
| CO | 4 | |
| FL | 16 | |
| MO | 258 | 8 |
| NEV | | 1 |
| OK | 25 | |
| PENN | 8 | |
| SD | 4 | |
| TENN | 2 | |
| TX | 16 | 2 |
| DC | 4 | |
| SUBTOTAL | 390 | 114 |
| UNCLASS. | 33 | 4 |
| TOTAL | 423 | 118 |

TABLE 17

Primitive Camping - 1976

| Destination | Urban Areas of Madison and St. Clair Counties | Harding Ditch Study Area |
|---|---|---|
| 2 | | 12 |
| 3A | 45 | |
| 4 | 211 | |
| 5 | 34 | 30 |
| ARIZ | 4 | |
| FL | 28 | |
| KENT | | 28 |
| MICH | 7 | |
| MO | 114 | |
| NC | 28 | |
| E SL | 174 | |
| SUBTOTAL | 645 | 70 |
| UNCLASS. | 197 | 4 |
| TOTAL | 842 | 74 |

TABLE 18

Camping You Can Drive In To - 1976

| Destination | Urban Areas of Madison and St. Clair Counties | Harding Ditch Study Area |
|---|---|---|
| 1A | 57 | |
| 2 | 26 | |
| 3A | 747 | 20 |
| 3B | 103 | |
| 4 | 673 | 269 |
| 5 | 253 | 71 |
| ARK | 19 | 75 |
| CA | 21 | |
| CO | 4 | 42 |
| FL | 320 | |
| IND | 3 | |
| IOWA | 9 | |
| KENT | 268 | |
| MICH | 2 | |
| MINN | 4 | 90 |
| MISS | 18 | |
| MO | 769 | 374 |
| ND | 28 | |
| OK | 21 | |
| TENN | 14 | 10 |
| TX | 24 | 42 |
| WISC | 58 | |
| DC | | 140 |
| E SL | 68 | 22 |
| SUBTOTAL | 3509 | 1155 |
| UNCLASS. | 918 | 18 |
| TOTAL | 4427 | 1173 |

TABLE 19

Recreational Bicycling - 1976

| Destination | Urban Areas of Madison and St. Clair Counties | Harding Ditch Study Area |
|---|---|---|
| 1A | 24 | 60 |
| 2 | 400 | |
| 3A | 32 | |
| 3B | 6 | |
| 4 | 531 | 146 |
| 5 | 32 | 40 |
| KENT | 21 | |
| MO | 7 | 155 |
| E SL | 1970 | 473 |
| SUBTOTAL | 3023 | 874 |
| UNCLASS. | 2593 | 599 |
| TOTAL | 5616 | 1473 |

TABLE 20

Horseback Riding - 1976

| Destination | Urban Areas of Madison and St. Clair Counties | Harding Ditch Study Area |
|---|---|---|
| 1A | 3 | |
| 2 | 2 | 6 |
| 3A | 40 | 1 |
| 4 | 29 | 20 |
| CO | 42 | |
| MO | 97 | 8 |
| MONT | 30 | |
| SD | 20 | |
| E SL | 5 | 22 |
| SUBTOTAL | 258 | 57 |
| UNCLASS. | 113 | 110 |
| TOTAL | 371 | 167 |

TABLE 21

Snowmobiling - 1976

| Destination | Urban Areas of Madison and St. Clair Counties | Harding Ditch Study Area |
|---|---|---|
| MICH | 84 | 0 |
| MINN | 6 | 0 |
| TOTAL | 90 | 0 |

TABLE 22

Off-Road Motorcycling - 1976

| Destination | Urban Areas of Madison and St. Clair Counties | Harding Ditch Study Area |
|---|---|---|
| 1A | 24 | |
| 2 | | 60 |
| 3A | 24 | |
| 4 | 222 | 311 |
| 5 | | 80 |
| ARK | 42 | |
| IND | 8 | |
| MICH | 64 | |
| MISS | 150 | |
| MO | 118 | |
| OH | 16 | |
| E SL | 573 | 311 |
| SUBTOTAL | 1241 | 762 |
| UNCLASS. | 1465 | 48 |
| TOTAL | 2706 | 810 |

TABLE 23

Off-Road Driving - 1976

| Destination | Urban Areas of Madison and St. Clair Counties | Harding Ditch Study Area |
|---|---|---|
| 4 | 210 | 201 |
| 5 | 7 | |
| MO | 121 | |
| MONT | 10 | |
| E SL | 200 | 201 |
| SUBTOTAL | 548 | 402 |
| UNCLASS. | 93 | |
| TOTAL | 641 | 402 |

TABLE 24

Swimming at Lake Michigan - 1976

| Destination | Urban Areas of Madison and St. Clair Counties | Harding Ditch Study Area |
|---|---|---|
| 2 | 16 | 155 |
| MICH | 12 | |
| SUBTOTAL | 28 | 155 |
| UNCLASS. | 20 | 16 |
| TOTAL | 48 | 171 |

TABLE 25

Beach Swimming Other than Lake Michigan - 1976

| Destination | Urban Areas of Madison and St. Clair Counties | Harding Ditch Study Area |
|---|---|---|
| 1A | 15 | |
| 2 | 307 | 5 |
| 3A | 270 | |
| 3B | 4 | |
| 4 | 1990 | 406 |
| 5 | 625 | 85 |
| AL | 3 | |
| ARK | 98 | 256 |
| CA | 510 | 1 |
| FLA | 330 | |
| GEOG | 48 | |
| IND | 201 | |
| KENT | 11 | |
| MICH | 20 | |
| MINN | 42 | |
| MISS | 8 | |
| MO | 1798 | 409 |
| NC | 50 | |
| PENN | 10 | |
| TENN | 6 | |
| TX | 39 | |
| WISC | 3 | 2 |
| E SL | 758 | |
| SUBTOTAL | 7146 | 1164 |
| UNCLASS. | 1597 | 155 |
| TOTAL | 8743 | 1319 |

TABLE 26

Lodging with Kitchen Facilities - 1976

| Destination | Urban Areas of Madison and St. Clair Counties | Harding Ditch Study Area |
|---|---|---|
| 1B | 3 | 1 |
| 2 | 124 | |
| 3A | 6 | |
| 4 | 95 | |
| 5 | 8 | |
| ARK | 20 | |
| CO | 43 | |
| FL | 184 | |
| LA | 21 | |
| MICH | 76 | 9 |
| MINN | 44 | |
| MO | 951 | 315 |
| OK | 15 | |
| TENN | 42 | |
| WISC | 12 | 4 |
| HAWI | 22 | |
| E SL | 84 | |
| SUBTOTAL | 1750 | 329 |
| UNCLASS. | 457 | 33 |
| TOTAL | 2207 | 362 |

TABLE 27

Lodging without Kitchen Facilities - 1976

| Destination | Urban Areas of Madison and St. Clair Counties | Harding Ditch Study Area |
|---|---|---|
| 3A | 6 | 1 |
| 4 | 10 | |
| 5 | 25 | |
| AL | 12 | |
| AR | 30 | |
| ARK | 10 | 4 |
| CA | 4 | 31 |
| CO | 3 | |
| FL | 221 | 44 |
| GEOG | 9 | |
| KENT | 12 | |
| LA | 12 | |
| MISS | 6 | |
| MO | 276 | 51 |
| TENN | 21 | |
| TX | 3 | |
| VA | 52 | |
| WISC | 48 | |
| DC | 36 | |
| E SL | 24 | |
| SUBTOTAL | 820 | 131 |
| UNCLASS. | 186 | 96 |
| TOTAL | 1006 | 227 |

Madison Counties. All other recreation travel and participation was coded by Governor's region or out-of-state destination. Table 4 portrays the number of households for which household demand and participation data were obtained, the populations of those households and the error percentages of calculations, e.g., for the HDSA the participation rate for any given activity will be up to 9 percent different if another sample of 116 households were drawn (at the 95% confidence level). In the survey, the average number of people per household in this inner study area was, 3.22 and this compares with 3.05 for the urban areas surveyed in Madison and St. Clair Counties; 3.36 for households surveyed in Governor's Region 4 and 2.80 for the entire survey of Illinois. According to the 1970 U.S. Bureau of the Census (5), the average number of people per household in the six towns of the HDSA was 3.36 and for the other twelve the average was 3.05. The sample averages, 3.22 and 3.05, were within the error limits for each sample's size and as a result we may consider the data as representative of the larger population from which it was taken. At this point one may notice that 552 interviews are recorded for the urban areas of St. Clair and Madison Counties (436 interviews outside of the St. Louis area) whereas only 506 interviews are listed as completed for these counties in Figure 2. This figure (552) includes partial information of a demographic nature or partial participation information whereas Figure 2 portrays only the number of one hundred percent completed interviews in the counties. The loss of data portrayed in the total reflects uncodable responses, miscoded data sheets, or other similar occurrences during the survey period. The population of the smaller HDSA (six towns) represents about 54.80 percent of the larger area's population or one can say that the larger area has 1.825 times the population of the smaller area. The smaller HDSA represents 19.64 percent of Region 4's

population. Approximately one household out of every 273 (33374/116 = 273.22) households residing in these six towns took part in this survey and data was collected for about one individual out of every 300 (112,156/373 = 300.69). In the urban areas of Madison and St. Clair Counties, approximately one household out of every 154 (67092/436 = 153.88) were sampled and this corresponded to one individual of every 161 (204671/1273 = 160.78). The discrepancy between the total number of households interviewed (116 against 436) given that over 112,000 people constitute a population slightly more than half that of the larger area of over 204,000 people, must be accounted for by the sampling technique, random digit telephone interviewing. Random digit dialing guarantees that all telephone exchanges will receive an equal opportunity for connections (interviews) but it cannot guarantee that connections will be successful. In the Department of Conservation Survey, callbacks of each telephone number were made three times.

Each household's completed interview had locational codes attached to both the household information and the recreation activity information. These codes were for the town, county, and governor's region. For households this meant that all of the reported socioeconomic data could be tabulated by a variety of socioeconomic measures. As a result of this locational coding one could develop many types of potential analyses for origin (residence) to destination (facility or sites) flows (participation in each outdoor recreation activity). Because locational codes were appended to both the household and supply information, regional activity patterns for our sample were easily tabulated with regard to both the region of residence and the region in which recreation behavior took place (occurrence). Additional codes were assigned for out-of-state destinations, for people residing outside of Illinois, for non-responses,

and for the situation where the household respondent knew that an activity took place in Illinois but did not remember the location at which the activity took place. By utilizing these additional codes for origins (places of residence) the researchers were able to maximize the utility of the data in deriving patterns of participation for the study area regions. Because of these locational codes, we were able to tabulate for each activity and governor's region an actual count of the number of activity days (people times days) originating in one study area region and which took place in another region.

Assuming that each sample of households is representative of each study area's population, we needed to multiply each region-to-region count of activity days by a number which describes the relationship between the total regional population of each area of origin and the population of the corresponding regional sample. For the HDSA this multiplier is 273.22 and for the urban areas of Madison and St. Clair counties the multiplier is 153.88. Thus:

$$\text{Activity Days}_{ij\ \text{sample}} \times \text{Regional Multiplier}_{1} = \text{Activity Days}_{ij\ \text{region}}$$

where i denotes the region of origin and j denotes the destination recreation area. The resulting activity day patterns preserve the original variations in actual recreation behavior of the people sampled within each study area. Tables 5 through 27 present the unadjusted activity day counts of participation for the twenty-three activities investigated in this study.

Unclassified activity day totals (with regard to destinations) reflect three possibilities. The first is that the subject or person interviewed by telephone simply cannot be accurate with regard to recreation behavior which occurred over the span of one year. The second possibility is that the

respondent was someone other than the head of the household or a participant in an activity (other household members having participated in the activity) and is therefore "fuzzy" on specifics with regard to activity participation. The third possibility is that the respondent is simply overstating actual participation and is therefore unable to name specific destinations.

By multiplying the totals for activity day for the study areas by their respective multipliers, one obtains the total participation levels for the households of the study areas for 1975/1976. Table 29 gives these estimates. More importantly, however, is the fact that the larger urban area has 1.825 times the population of the smaller area. If all things were equal, one would expect the larger area to have about 1.825 times as much participation as the smaller area. That is to say, that if household participation rates and the intensity of each household's participation (the number of activity days per household) were about equal, we would expect an activity day total for the urban areas of Madison and St. Clair counties which would be 1.825 times as large. Table 28 also contains the ratio of participation in the larger area to that of the smaller area. If the household participation rates and the intensity of household participation are different, one may diagnose the difference from the third column of Table 28. Whenever the ratio in column (3) of the table exceeds 2.01 or goes below 1.65 we can reject this hypothesis and conclude that the patterns are significantly different (either overparticipation or underparticipation. See footnote 6). Table 29 shows the average number of activity days of participation per participant and the rank order of the values and the rank order of the intensity of participation statewide. Some activities have high mean values and ranks in the C.O.E. inner study area because of small sample sizes (numbers of participants)

TABLE 28

Total Participation Estimates for 1976

| Activity | (1) Urban Areas of Madison and St. Clair Counties | (2) H. Ditch Study Area | (3) (1) ÷ (2) |
|---|---|---|---|
| Canoe-Rivers & Streams | 64322 | 81966 | .78** |
| Canoe-Lakes & Ponds | 48011 | 2732 | 17.57* |
| Sailing on Lake Michigan | 616 | 1232 | .50** |
| Sailing Except Lake Michigan | 13483 | 3279 | 4.11* |
| Motorboating, 10 HP or Less | 226612 | 78414 | 2.89* |
| Motorboating on Lake Michigan | 10156 | 1092 | 9.30* |
| Motorboating, 10 HP or More | 732315 | 254368 | 2.88* |
| Day Hiking | 477740 | 260105 | 1.84 |
| Overnight Camping | 45241 | 21857 | 2.07* |
| Camping with an Org. Group | 260519 | 8197 | 31.78* |
| Camping Enroute | 65091 | 32240 | 2.02* |
| Primitive Camping | 129567 | 20218 | 6.41* |
| Camping You Can Drive Into | 681227 | 320488 | 2.13* |
| Recreational Bicycling | 864190 | 402453 | 2.15* |
| Horseback Riding | 57089 | 46628 | 1.22** |
| Snowmobiling | 13849 | negligible | |
| Off-Road Motorcycling | 416399 | 221308 | 1.88 |
| Off-Road Driving | 98637 | 109834 | .90** |
| Swimming at Lake Michigan | 7386 | 46721 | .16** |
| Beach Swimming not at L. M. | 1345373 | 360378 | 3.73* |
| Swimming at Pools | 1648055 | 1737952 | .95** |
| Lodging with Kitch. Fac. | 339613 | 98906 | 3.43* |
| Lodging w/out Kitch. Fac. | 154803 | 62021 | 2.50* |

**Larger than expected participation *Smaller than expected participation

TABLE 29

Activity Days of Participation Per Participant (1976)

| Activity | Urban Areas of Madison and St. Clair Counties | Rank | H. Ditch Study Area | Rank | State Ranking |
|---|---|---|---|---|---|
| Canoe-Rivers & Streams | 5.09 | 18 | 30.00* | 3 | 22 |
| Canoe-Lakes & Ponds | 8.05 | 14 | 3.33* | 18 | 10 |
| Sailing on Lake Michigan | 2.00 | 23 | 2.66* | 19 | 14 |
| Sailing Except Lake Michigan | 2.94 | 21 | 2.00* | 20 | 15 |
| Motorboating, 10 HP or Less | 12.26 | 8 | 9.90 | 11 | 11 |
| Motorboating on Lake Michigan | 2.59 | 22 | .66* | 22 | 13 |
| Motorboating, 10 HP or More | 16.21 | 6 | 20.69 | 7 | 9 |
| Day Hiking | 9.88 | 12 | 13.41 | 10 | 8 |
| Overnight Camping | 3.94 | 19 | 3.48 | 17 | 20 |
| Camping with an Org. Group | 14.78 | 7 | 1.30* | 21 | 18 |
| Camping Enroute | 5.69 | 17 | 6.21 | 14 | 21 |
| Camping You Can Drive Into | 11.67 | 13 | 7.40* | 13 | 16 |
| Primitive Camping | 9.07 | 9 | 15.23 | 8 | 12 |
| Recreational Bicycling | 29.41 | 2 | 23.02 | 6 | 3 |
| Horseback Riding | 3.68 | 20 | 4.77 | 15 | 17 |
| Snowmobiling | 6.00 | 15 | 0.00* | 23 | 4 |
| Off-Road Motorcycling | 24.42 | 4 | 23.14 | 5 | 5 |
| Off-Road Driving | 26.08 | 3 | 67.00* | 1 | 2 |
| Swimming at Lake Michigan | 10.43 | 11 | 28.50* | 4 | 7 |
| Beach Swimming not at L.M. | 19.50 | 5 | 14.66 | 9 | 6 |
| Swimming at Pools | 30.05 | 1 | 52.14 | 2 | 1 |
| Lodging with Kitch. Fac. | 10.66 | 10 | 8.62 | 12 | 19 |
| Lodging w/out Kitch. Fac. | 5.93 | 16 | 4.73 | 16 | 23 |

*Small Sample Size

because the mean (arithmetic average) is sensitive to extreme values (such as those generated by a-typical recreation trips). From a cursory inspection of these tables one might conclude that those activities which are water oriented, least strenuous, or inexpensive to participate in are the ones within which the HDSA residents concentrate their activity. With regard to the intensity of participation when comparisons are possible, major differences are not apparent. Furthermore, one might suggest (from Tables 5 through 27) that:

1) participation in several activities is heavily oriented towards out-of-state destinations (Canoeing, Sailing, Camping with Organized Groups, Transient Camping, Lodging with and without Kitchen Facilities);

2) participation in other activities is highly localized in the study areas (Recreational Bicycling, Off-Road Motorcycling, Off-Road Driving, Swimming at Pools);

3) participation in several activities is localized in areas adjacent to the study area but not out-of-state (Motorboating with 10 HP or Less, Motorboating with 10 HP or More, Day Hiking, Overnight Hiking, Camping You Can Drive Into, Horseback Riding, Off-Road Motorcycling, Off-Road Driving, Beach Swimming).

Initially, one might then suspect that certain demographic features of households might be related to the above. When Student t-tests were performed on the mean values (for unequal variance and unequal sample sizes) no statistically significant difference were found to exist at the 95 percent confidence level. Appendix C displays the average values of demographic characteristics where sample sizes were large enough to allow for comparisons. No significant differences were found between income levels but the results were deceptive. At the state level, the mean annual income households was

between $14,000 and $15,999. However, about 30 percent of the respondents were not household heads (since any person answering the phone over 18 years of age qualified to be interviewed) and were not always aware of the household's annual gross income. Another one-third of the respondents refused to answer this question and because of this concern, the income question was the last question on the survey. The result is that data were obtainable only from those people who wanted to answer the question. In the smaller study area, the refusal rate for the question was somewhat higher but not much higher (approximately 70% as compared to 63%) and the non-answer rate was about the same in the urban areas of Madison and St. Clair Counties as in the state (65% as compared to 63%). One further cautionary note needs mentioning: for any survey it is impossible to measure the degree to which respondents inflate their incomes or deflate them when responding to such questions. We must assume that the biases of respondents cancel out.

The tables do, however, show a clear consistency in the pattern of distances travelled to recreation facilities and their corresponding travel times. Distances and Travel Times to the left of the slash marks in the tables represent the average distance travelled and the time it took to get to all destinations (in-state and out-of-state). Distance and travel times to the right of the slash marks indicate distances and travel times to destinations within Illinois. There do not appear to be widely differing travel time or distance patterns between these areas and the overall state pattern indicating that the residents of the Harding Ditch study area are not inherently at a disadvantage with regard to access to recreation destinations (facilities). One may wish to interpret the within-state distances and travel times as being normal recreation trips and the longer distances and travel times as being

related to paid vacation days or other multi-day holiday trips and the difference in the number of paid vacation days. This analysis does seem to support this idea. Nevertheless, such a conclusion is based on limited sampling and needs further verification to be completely reliable.

Changes in Recreation Behavior Over Time

In addition to accounting for present outdoor recreation behavior in terms of supply features, accessibility measures and household characteristics, it is of great importance that patterns of change in recreation participation be monitored through time. In monitoring change in the number of activity days households participate in outdoor recreation activities, it is important to measure the relative effects of access, household characteristics, and supply features upon the frequency of household participation. Stable relationships between frequency of household participation and these three groups of characteristics will allow forcased patterns of recreation behavior to be accurate for longer periods of time than unstable relationships.

Between 1972 and 1976-77 only a few minor changes have occurred in the total water surface acreage within Illinois. The Department of Conservation's Illinois Water Surface Inventory for 1976 shows only a small percentage increase in the total acreage of all rivers, streams, lakes and ponds which were inventoried. And although a few major constructions were begun during this five year period, most of the changes were specific to a few regions. Furthermore, while it is obvious that the addition of new parks/areas increases total usage of all parks or areas. However, it is not evident that adding new recreation areas changes the general relationship between the amount of household participation (activity days) in outdoor activities and the total quantity of supply at all parks or areas. In addition, we have assumed that new highway

construction during the past five years has not directly affected the general patterns of accessibility of households with regard to recreation facilities. Most of Illinois' interstate highways were completed by 1971 and since that time very few, if any, totally new roads have been built which would affect the linkages between towns in the Illinois road network. We drew these conclusions by examining official Department of Transportation highway maps for this five year period.

Beyond changes in the relationships between demographic characteristics and household participation, in recreation activities, we only need to consider two aspects of household participation to produce activity-by-activity and area-by-area forecasts of future participation. First, changes in the percentage of households participating in recreation activities must be identified, because activity days can be influenced by an increase in the percentage of households participating in activities even when individual households do not change their frequency of participation in an activity over a given time period. The second factor which can affect household recreation activity day estimates is changes within househods which lead to increases in the number of activity days that each household spends in recreation activities. In order to examine the influence of the first factor, change in the "popularity" of outdoor activities, the participation rates of households were calculated for 1976 and 1971 for each activity for each region of the study area (see Tables 30 and 31). Each participation rate portrayed in Tables 30 and 31 shows the number of households of the total households sampled (by region) which reported participation in each recreation activity. Table 32 shows the difference in the percentages for the five year period 1971-1976. When a figure in this table exceeds these error measurements (at the bottom of the table), one can

TABLE 30

1976 Participation Rates for Households (in Percent)

| | HDSA | Urban Areas of Madison & St. Clair Counties | Region 3A | Region 4 | State |
|---|---|---|---|---|---|
| Canoe-Rivers & Streams | 2.6 | 9.7 | 9.1 | 8.0 | 5.8 |
| Canoe-Lakes & Ponds | 0.9 | 2.9 | 7.5 | 2.7 | 4.6 |
| Sailing on Lake Michigan | 0.9 | 0.4 | 0.8 | 0.6 | 1.6 |
| Sailing Except Lake Michigan | 1.7 | 2.5 | 5.4 | 2.4 | 3.3 |
| Motorboating, 10 HP or Less | 7.8 | 10.1 | 11.7 | 10.8 | 8.3 |
| Motorboating on L.M. | 1.7 | 1.8 | 0.6 | 1.4 | 2.3 |
| Motorboating, 10 HP or More | 12.1 | 24.9 | 27.5 | 24.5 | 18.5 |
| Day Hiking | 19.0 | 29.2 | 36.4 | 26.6 | 26.6 |
| Overnight Camping | 6.0 | 6.9 | 5.6 | 5.2 | 4.6 |
| Camping with an Org. Group | 6.0 | 8.3 | 7.2 | 6.6 | 6.4 |
| Camping Enroute | 5.2 | 6.9 | 9.6 | 6.0 | 6.0 |
| Primitive Camping | 2.6 | 7.2 | 7.0 | 5.8 | 5.0 |
| Camping You Can Drive Into | 20.7 | 34.3 | 33.6 | 31.1 | 24.5 |
| Recreational Bicycling | 17.2 | 17.3 | 14.8 | 14.3 | 14.2 |
| Horseback Riding | 9.5 | 10.5 | 10.1 | 9.5 | 10.0 |
| Snowmobiling | 0.0 | 1.1 | 3.6 | 0.8 | 3.7 |
| Off-Road Motorcycling | 9.5 | 10.1 | 13.2 | 9.4 | 8.1 |
| Off-Road Driving | 0.9 | 2.9 | 4.1 | 2.9 | 2.6 |
| Swimming at Lake Michigan | 1.7 | 1.4 | 4.7 | 1.3 | 7.5 |
| Beach Swimming not at L.M. | 24.1 | 36.8 | 38.1 | 25.3 | 29.2 |
| Swimming at Pools | 32.8 | 40.4 | 50.2 | 37.4 | 34.3 |
| Lodging with Kitch. Fac. | 11.2 | 17.3 | 13.9 | 15.4 | 11.1 |
| Lodging w/out Kitch. Fac. | 12.9 | 14.8 | 13.3 | 14.2 | 11.0 |

TABLE 31

1971 Participation Rates for Households (in Percent)

| | HDSA | Urban Areas of Madison & St. Clair Counties | Region 3A | Region 4 | State |
|---|---|---|---|---|---|
| Canoe-Rivers & Streams | 3.4 | 8.3 | 7.7 | 5.8 | 4.8 |
| Canoe-Lakes & Ponds | 0.9 | 2.9 | 6.2 | 2.4 | 3.6 |
| Sailing on Lake Michigan | 0.9 | 0.4 | 0.5 | 0.4 | 1.1 |
| Sailing Except Lake Michigan | 1.7 | 1.8 | 4.1 | 1.7 | 2.6 |
| Motorboating, 10 HP or Less | 7.8 | 10.8 | 10.5 | 11.5 | 8.4 |
| Motorboating on L.M. | 0.0 | 0.4 | 1.3 | 0.1 | 2.1 |
| Motorboating, 10 HP or More | 7.8 | 23.8 | 24.5 | 22.4 | 16.5 |
| Day Hiking | 22.4 | 28.5 | 32.5 | 26.8 | 23.7 |
| Overnight Camping | 6.0 | 5.4 | 5.6 | 4.1 | 4.3 |
| Camping with an Org. Group | 6.9 | 9.0 | 8.5 | 7.7 | 5.7 |
| Camping Enroute | 6.0 | 8.3 | 8.8 | 7.4 | 5.8 |
| Primitive Camping | 4.3 | 7.6 | 6.4 | 6.0 | 4.9 |
| Camping You Can Drive Into | 16.4 | 27.1 | 28.2 | 25.5 | 20.5 |
| Recreational Bicycling | 12.1 | 15.2 | 13.2 | 13.2 | 13.6 |
| Horseback Riding | 11.2 | 11.2 | 14.4 | 12.5 | 12.0 |
| Snowmobiling | 0.0 | 0.7 | 3.4 | 0.8 | 3.1 |
| Off-Road Motorcycling | 4.3 | 8.7 | 11.1 | 8.3 | 7.0 |
| Off-Road Driving | 2.6 | 3.2 | 1.8 | 2.9 | 1.9 |
| Swimming at Lake Michigan | 2.6 | 2.5 | 4.6 | 1.9 | 7.9 |
| Beach Swimming not at L.M. | 19.0 | 31.0 | 37.8 | 30.4 | 29.8 |
| Swimming at Pools | 31.9 | 37.9 | 47.6 | 21.1 | 32.4 |
| Lodging with Kitch. Fac. | 8.6 | 15.2 | 15.2 | 14.7 | 11.8 |
| Lodging w/out Kitch. Fac. | 7.8 | 10.8 | 13.0 | 11.6 | 10.2 |

say that a significant change has occurred in the regional participation rate. The reader will note that none of the tabled values exceed the 99% confidence measurements for the two study areas of the Corps of Engineers. There are, however, some sizeable variations from region to region but such occurrences are inherently included in the origin to destination flow patterns of activity days. It is worth noting that only in the rarest of cases does the popularity of a recreation activity increase or decrease by as much as one percent per year.

At this juncture a serious conceptual problem becomes apparent. If one is to utilize this information in projecting activity day patterns, it is necessary to decide whether or not these trends (the fourteen significant changes in popularity) are likely to continue into the future, or are likely to be no more than aberrations of this five-year time period. For example, if an activity's popularity increased by an average one percent per year between 1971 and 1976, it would be required to assume that increases in popularity will continue to grow by the same amount through 1995. This is a particularly worrisome assumption because of the resource allocation decisions that might result. For example, if one predicts a constant rate of increase in popularity through 1995 and then generates a set of resource allocation decisions, one may have allocated money to the development of facilities for a predicted usage that may never materialize. On the other hand, too conservative a procedure, such as ignoring changes in these popularity estimates, can only result in a decision maker's failure to alleviate resulting overcrowding at recreation facilities in the present and near future. To resolve the dilemma, a frequent surveying of changes in household participation rates needs to be undertaken in order to better understand the patterns of growth in

TABLE 32

Growth in Participation Between 1971 and 1976 (Net Change in Percent)

| | HDSA | Urban Areas of Madison & St. Clair Counties | Region 3A | Region 4 | State |
|---|---|---|---|---|---|
| Canoe-Rivers & Streams | -0.8 | 1.4 | 1.4 | 2.2 | 1.0 |
| Canoe-Lakes & Ponds | 0.0 | 0.0 | 1.3 | 0.3 | 1.0 |
| Sailing on Lake Michigan | 0.0 | 0.0 | 0.3 | 0.2 | 0.5 |
| Sailing Except Lake Michigan | 0.0 | 0.7 | 1.3 | 0.7 | 0.7 |
| Motorboating, 10 HP or Less | 0.0 | -0.7 | 0.7 | -0.7 | -0.1 |
| Motorboating on L. M. | 1.7 | 0.6 | -0.7 | 1.3 | 0.2 |
| Motorboating, 10 HP or More | 4.3 | 1.1 | 3.0 | 1.9 | 2.0 |
| Day Hiking | -3.4 | 0.7 | 3.9 | -0.2 | 2.9 |
| Overnight Camping | 0.0 | 1.5 | 0.0 | 1.1 | 0.3 |
| Camping with an Org. Group | -0.9 | -0.7 | -1.3 | -1.1 | 0.7 |
| Camping Enroute | -0.8 | -1.4 | 0.8 | -1.4 | 0.2 |
| Primitive Camping | -1.7 | -0.4 | 0.6 | -0.2 | 0.1 |
| Camping You Can Drive Into | 4.3 | 7.2 | 5.4 | 5.6 | 4.0 |
| Recreational Bicycling | 5.1 | 2.1 | 1.6 | 1.1 | 0.6 |
| Horseback Riding | -1.7 | -0.7 | -4.3 | -3.0 | -2.0 |
| Snowmobiling | 0.0 | 0.4 | 0.2 | 0.0 | 0.6 |
| Off-Road Motorcycling | 5.2 | 1.4 | 2.1 | 1.1 | 1.1 |
| Off-Road Driving | -1.7 | 0.3 | 2.3 | 0.0 | +0.7 |
| Swimming at Lake Michigan | -0.9 | -1.1 | 0.1 | -0.5 | -0.4 |
| Beach Swimming not at L.M. | 5.1 | 5.8 | 0.3 | 3.5 | -0.6 |
| Swimming at Pools | 0.9 | 2.5 | 2.6 | 2.5 | 1.9 |
| Lodging with Kitch. Fac. | 2.6 | 2.1 | -2.7 | 1.3 | 0.7 |
| Lodging w/out Kitch. Fac. | 5.1 | 4.0 | 0.3 | 2.6 | 0.8 |
| 95% level | 9.1% | 5.9% | 3.2% | 3.7% | 1.0% |
| 99% level | 12.0% | 7.8% | 4.2% | 4.9% | 1.3% |

popularity for recreation activities. Perhaps, a survey for each of the next five years, which utilizes random sampling procedures and large sample sizes for the study areas, might best provide such empirical evidence.

The other household variation which needs to be monitored because of its potential effect upon forecasting total activity day patterns is the average number of activity days that households participated in outdoor activities. By area of origin, the average number of activity days for a household (the mean) was computed as well as the variation in activity days (the standard deviation). These computations were made for the 1976 household reports of participation by activity. Given unequal sample sizes (the number of households participating in an outdoor activity), the average number of activity days reported by households, and the measure of variation in activity days among households, a "Student t-test" for significant differences between estimates was calculated. None of the differences in means (average number of activity days per household) were statistically significant at the ninety-five percent level of confidence. Furthermore, they would not have been significant at the ninety-nine percent level of confidence for a rather simple reason: the standard deviations among the samples (the measure of variation around the average frequency of household activity days) were sufficiently large so that the difference between the largest and smallest averages of per household activity days were less than one standard deviation away from the activity day averages of either the largest or smallest figures.

As a result of these analyses and the preceding descriptions of recreation patterns our projections for 1980, 1985, 1990, and 1995 are based upon the urban-demographic characteristics of the study area. Any features relating to both the quantity of supply for available recreation facilities and

the relative location of households to such facilities must be assumed to be inherent in the 1976 activity day counts and the projections for 1980, 1985, 1990, and 1995 because the 1976 activity day counts are just the summation of each household's circumstances; demographic, social, economic, and relative location to alternative recreation facilities.

Thus for the six towns of the inner study area we expect an increase in recreation participation of 2 percent for 1980; 2.2 percent for 1985; 7.4 percent for 1990 and 10.7 percent for 1995. For the urban areas of both Madison and St. Clair Counties we expect an increase in recreation participation of 1.5 percent in 1980; 1.4 percent in 1985; (down 0.1 percent from 1980); 6.9 percent in 1990; 13.3 percent in 1995. These projected changes in population come from the Illinois' Bureau of the Budget's revised forecasts for 1970 through 2025. The method used for developing the projections for each five year interval is the cohort-survival method and is described by the Bureau of the Budget elsewhere (7).

# THE MULTIPLE REGRESSION ANALYSES

## INTRODUCTION

Besides the general narrative describing how forecasts for each recreation activity were derived, this report serves the purpose of depicting the degree of association between social, economic, and demographic characteristics of households, patterns of access of the population to recreation facilities, and the quantity or supply of facilities as they relate to the frequency of household participation in each outdoor recreation activity. This information is derived by a set of complementary analyses which are the most applicable to the planning process because the relationships which are analyzed and measured actually describe the degree to which individual household participation rates are influenced by characteristics of supply, characteristics of access, and household features.

In performing these analyses, a single multivariate statistical procedure has been utilized because of its long history as a predictive and descriptive tool in the social and physical sciences. The flexibility of Multiple Correlation and Regression Analysis lies in the fact that many different types of descriptive measures may be simultaneously corelated to a measure of the utmost importance for recreation planning: the number of household activity days spent in outdoor recreation activities. The techniques used in these analyses identify the characteristics which are the most relevant for measuring changes in household participation. For each activity analyzed through these techniques, we have identified those supply related features

which best predict the frequency of participation of households (Table 33).

In the previous section of this report, approximately fifty (50) characteristics of households (social, economic, and demographic features) and supply and accessibility characteristics were defined and explained in terms of how they were measured for each household and for the destinations most frequently utilized by households in participating in outdoor recreation activities. Because of the likely interrelationships among household characteristics and quantities of supply characteristics, three different but complementary computer analyses were undertaken for each outdoor recreation activity. In the first analysis, only demographic and social and economic characteristics of households were related to the frequency with which households participated in recreation activities. This first analysis allowed the investigators the chance to determine the degree to which variation in household behavior (activity days spent in a recreation activity) could be accounted for by only demographic, social, or economic characteristics of households. Much of past recreation research has indicated that household characteristics often discriminate among the types of activities which households take part in and that they also have an effect upon the frequency of participation in outdoor activities. The second analysis was performed with a different purpose in mind. We wanted to assess the effect of household and supply characteristics upon household participation rates given that household participation patterns had stabilized. The third Multiple Correlation and Regression Analysis allowed the investigator the opportunity that is most important for long range planning in recreation facility planning: an assessment of the effect of quantity of supply characteristics at recreation areas upon the frequency of household participation. To identify the best set of predictors

TABLE 33

The Major Predictors of
Recreation Participation During 1976

| Activity | Best Predictors |
|---|---|
| A. Canoeing on Rivers and Streams | 1. household income<br>2. surface acreage of water<br>3. number of totally developed acres<br>4. number of lakes at or near canoeing site<br>5. surface acreage of nearby lakes or ponds |
| B. Canoeing on Lakes and Ponds | 1. surface acreage of lakes<br>2. no. of O.R.V. trails<br>3. multiple purpose trip index<br>4. number of cabins |
| C. Sailing on Lake Michigan | 1. no. of children 13-17 years<br>2. income of household<br>3. distance from Lake Michigan<br>4. length of work week<br>5. number of work hours in a week |
| D. Sailing Except on Lake Michigan | 1. no. of unrestricted lakes in an area<br>2. no. of O.R.V. trails<br>3. total acreage of facilities<br>4. no. of launches<br>5. no. of beaches<br>6. no. of lakes<br>7. whether or not sailing permitted |
| E. Motorboating, 10 HP or Less | 1. distance to the facility<br>2. whether or not a household participated in 1971 (prior experience) |
| F. Motorboating on Lake Michigan (insufficient variance with regard to supply features) | 1. distance from Lake Michigan<br>2. no. of launches |
| G. Motorboating, 10 HP or More | 1. distance to the facility<br>2. no. of children 13-17<br>3. lake surface acreage<br>4. total acreage of facilities |

| Activity | Best Predictors |
|---|---|
| R. Off-Road Driving | 1. percent male<br>2. no. of children 0-2<br>3. no. of children 6-12<br>4. no. of workdays in a week<br>5. no. of work hours in a week<br>6. size of town in which the respondent grew up |
| S. Swimming at Lake Michigan | 1. no. of children 6-12<br>2. no. of children 13-17<br>3. no. of work hours in a week |
| T. Beach Swimming Not at Lake Michigan | 1. no. of children 6-12<br>2. no. of children 13-17<br>3. distance to facility<br>4. no. of nearby swimming pools<br>5. no. of O.R.V. trails |
| U. Swimming at Pools | 1. total acres of facility<br>2. no. of children 6-12<br>3. no. of pools in town<br>4. no. of unrestricted lakes (nearby) |
| V. Lodging with Kitchen Facilities | 1. distance to facilities<br>2. the variety index<br>3. no. of children 0-2<br>4. no. of children 6-12 |
| W. Lodging without Kitchen Facilities | 1. average age of household<br>2. no. of children 3-5<br>3. no. of children 6-12<br>4. household education level<br>5. household income level<br>6. no. of pools at facility<br>7. no. of horseback riding trails<br>8. no. of nature trails<br>9. no. of lodge units<br>10. no. of cabins<br>11. no. of unrestricted surface acres of water |

of households' frequencies of participation, several indicators were used. These were:

1) the Correlation Coefficients of each predictor variable with the frequency of participation of households (r),

2) the Regression Coefficients of the predictor variables (b) which measure the rate of change between each predictor and the frequency of household participation in an outdoor activity,

3) the Standard Error of the Regression Coeffient,

4) the Standardized Regression Coefficient (beta) which allows researchers to directly compare the relative importance of predictor variables, and

5) the F-statistic for each predictor variable which helps one to assess the statistical significance of relationships derived by other statistical indicators.

Also used, but to a lesser degree, was the standard deviation around the average value of the predictor variables.

Use of the Regression Coefficients (b)

How can one use the information from these multiple regression analyses? We may say that there are three general ways. The first way is to compare the relative magnitude of the standardized regression coefficients (the betas). These measures allow one to describe the relative importance of one supply or demographic feature relative to another. The ratio of two characteristics' beta values shows the relative importance of one variable to another. Thus, one may derive an indication of the relative importance of variables in accounting for variations in household behavior. The second manner in which one may use these analyses is by a joint use of recreation participation rates (Table 30) for the C.O.E. area and the urban areas of Madison and St. Clair Counties and the coefficients of regression (b) described in each subsequent

analyses. By multiplying the participation rate of a given recreation activity (Canoeing on Rivers and Streams had a 2.6 percent participation rate in 1976) times the "b" coefficients (the surface acreage of water had a b = .00619) times the sample multiplier (the C.O.E. multiplier was 273.22) one receives an estimate of how much additional recreation participation would be derived by an increment of one surface acre of water on rivers and streams for the population residing in the six towns of the C.O.E. area (b x participation rate x sample multiplier; .00619 x .026 x 273.22 = .044 activity days). For an increment of 1000 square acres of water surface, one would expect (.00619 x .026 x 273.22 x 1000 = 43.96 additional activity days). Besides adding 1000 acres of water surface for canoeing on rivers and streams, one might also add one hundred acres of developed property at access points to rivers and streams (the average acreage of fully developed properties for canoeing on rivers and streams was 166.25 acres). Hence one would need to multiply the 2.6 percent participation rate times the "b" coefficient (.50149) times the East St. Louis population multiplier (273.22) times 200 acres (.026 x .50149 x 273.22 x 200 = 712.436). Therefore if 1000 acres of water surface were added to a park or area and 200 acres of fully developed facilities were provided, one would expect an increase in canoeing on rivers and streams by St. Louis Residents of 43.96 + 712.49 activity days. Such gains in activity days can be calculated for <u>each relevant supply feature</u> and added into the calculations. The third manner in which these regression analyses can be used is by a comparison of the supply features of this analysis which are described as most important for each activity with those supply features which relate the recreation participation in other areas of the U.S. The results of the following sections are most relevant to the people sampled in this study. The general applicability

of the findings depends upon future studies and comparisons.

Before turning to the findings let us consider several cautionary notes. First, regression coefficients are variable and not exact. Second, multiple regression (as used here) represents a linear combination of "independent" variables. When beta coefficients (standardized regression coefficients) are very large, we can be sure that two or more variables are interrelated (co-linear) and not independent. Thus, when one generates an increment in activity days by utilizing regression coefficients, one is actually estimating the change in recreation activity days as a function of the predictor variable and all the variables with which it is co-linear. This is a significant obstacle to exact interpretation and can be overcome by the use of causal path analysis modeling which is time consuming and expensive. Lastly, the variables of this study are used in their original form of measurement and are assumed to be linearly related to participation. This is because interpreting the relationship between participation and the logarithm of distance (or some other data transformation) is less easy than between participation and actual distance. The result of this, however, is generally an underestimation of the relationships between variables. At this point, the reader may ask: "If there are so many statistical limitations, what is the value of such analyses?" The answer to such a question is that one simply has nothing better. Secondly, as we have said, the relationships are conservative in nature and may underpredict slightly because of the linear assumptions underlying the model. Thirdly, all the supply variables are subject to these limiting conditions and such errors or variations in estimates tend to cancel out. The overall result of these cautionary notes should be to indicate that the analyses need to be supplemented by two things: 1) the subjective judgments of professionals who have worked

with the Corps of Engineers on other similar projects and 2) a healthy dose of conservatism and caution. As we have said, regression analyses and measurements are approximate and adequately calibrated but they do not account for all household behavior. In essence, then, we are simply cautioning against the absolute and unquestioned use of the information presented here.

1. Canoeing on Rivers and Streams*

For the households who participated in this activity, an average of 13.3 activity days was spent canoeing on rivers and streams for which supply data existed. Only 8.74 percent of all participation rates could be accounted for by all demographic and household characteristics. When supply characteristics were included in the analysis, 54.64 percent of households recreational behavior (activity days) was explainable. The average distance travelled by participants in this activity (in getting to the destination where the activity was performed) was 31.19 miles (in-state). The average travel time was 43.05 minutes. The most important demographic characteristic in this analysis was income and it was less than one-sixth the importance of the most important supply characteristic, surface acreage. The average surface acreage for facilities for which there was supply data was 1,271.7 acres (b = .00619; beta = 4.48). The second most important supply characteristic was the number of totally developed acres at the facility with an average size of 166.25 acres for those facilities at which supply data existed (b = .50149; beta = 4.08). A one acre increment of developed acreage at canoeing facilities yields

*All of these analyses are for the urban households of Madison and St. Clair Counties including the six town HDSA area. The six-town HDSA area had insufficient sample sizes (116 households) for an activity-by-activity analysis. Activities with double asterisks are for the state as a whole.

an increase of .50149 activity days for each participating household. The approximate size of developed acreage at canoeing facilities was 150 acres. The next best predictor was the number of lakes at or near the canoeing area (b = 8.42; beta = 3.66). The surface acreage of nearby lakes or ponds was the next most important predictor (b = 13.475; beta = 1.42), and for an increment of one surface acre in each nearby lake, household participation will increase by 13.475 activity days. After these initial variables, all others were relatively less important with beta values of 1.00 or less. While the number of lodge units and the number of cabins had large beta values, they had extremely large standard errors of estimate for their associated regression coefficients and were deemed highly unreliable predictors although they are related to the frequency of participation in canoeing on rivers and streams.

2. Canoeing on Lakes and Ponds**

For the households who participated in this activity an average of 29.18 activity days were spent on facilities for which reasonable supply data existed. Only 11.09 percent of household participation rates in this activity could be accounted for with demographic and general household characteristics. With supply characteristics in the analysis, 42.9 percent of household behavior could be related to predictor variables. The average distance travelled by households was 188.10 miles and a travel time of 201.59 minutes accompanied this travel distance (in-state). Canoeing on lakes and ponds is not nearly as localized as that of canoeing on rivers and streams. The single most important feature of facilities was surface lake-acreage (b = 15.98; beta = .788) with an average value of .696 acres. The second most important characteristic was the number of O.R.V. trails (b = 3.96; beta - .318) with an average

of 3.66 trails. The third most important feature was the multiple purpose trip index for recreation facilities (b = -34.26; beta = -.682) which indicates that this activity is relatively independent of other activities. The next most significant variable was the number of cabins at the facility (b = -389.26; beta = -.609). An increase of one cabin in these facilities will result in a loss of 389.26 activity days at the average facility, indicating that this is a low density recreation activity. All other features were less than half as important as these features although there was a statistically significant distance/travel time effect.

3. Sailing on Lake Michigan**

An average of 23.19 activity days for participating households was spent in sailing on Lake Michigan. The average distance travelled was 54.49 miles and associated with it was a travel time of 86.05 minutes. Only 7 percent of all household behavior could be related to demographic features and supply features did not vary significantly. The best predictor of activity days in sailing on Lake Michigan was the number of children in a household between 13 and 17 years of age (b = 36.79; beta = .545). The second best predictor was income (beta = .373) and a third best was distance (beta = .208). Length of work week and the number of hours worked in a week were also adequate predictors of frequency of participation. No other variables made a statistically significant contribution to the explanation of household behavior.

4. Sailing Except on Lake Michigan**

An average of 21.20 activity days was spent in this activity by house-

holds who participated in sailing at facilities for which adequate supply data existed. The average distance travelled was 32.25 miles and had an associated travel time of 44.55 minutes. Demographic data accounted for less than1 percent of household behavior whereas supply variables brought the total explainable household behavior pattern up to 61.4 percent. The best predictors are the number of unrestricted lakes (b = 5356.37; beta = -69.26; mean .4815), the number of O.R.V. trails (b = -247.32; beta = -60.41; mean = 1.89), the number of acres of the facility (b = .106; beta = 52.18; mean = 20895.8), whether or not sailing is permitted (b = 813.29; beta = 21.59), the number of launches (b = 43.55; beta = 14.11; mean = 12.44), the number of beaches (b = 275.1; beta = 11.01; mean = 1.59), and the number of lakes (b = -51.90; beta = -12.17; mean = 6.037). A one acre change in the number of unrestricted lakes will yield a large loss of activity days. This is probably because once a lake is opened to motorboating traffic the quality of the sailing experience is essentially changed. As the number of O.R.V. trails increases by one, a less drastic drop in activity days of sailing occurs. As the total acreage of the recreation facility increases by one acre, an additional .106 activity days of sailing are generated for each participating household. Obviously whether or not sailing is permitted has an initial threshold effect on the amount of sailing. However, we can also say that the number of activity days of sailing over 813.29 at an average facility is due to other characteristics. The creation of any new sailing facility, will yield a base of 813.29 activity days of sailing (the constant of the regression equation). The number of launches also is important as are the number of beaches at sailing facilities.

5. Motorboating with 10 Horsepower or Less

For this activity an average of 25.81 activity days is done per household which goes motorboating. The average distance travelled is 50.03 miles with a travel time of 81.96 minutes (in-state). The regression constant is 23.69 and the variance accounted for by all the analyses never exceeds two percent. Whether or not a household did the activity in 1971 and the distance to the recreation facility are the only variables which account for any significant variance in household frequency and none of the supply characteristics in the analyses were useful predictors.

6. Motorboating on Lake Michigan**

No statistically significant amount of variance could be accounted for by any of the variables used as predictors despite the fact that an average of 23.52 activity days was the norm for households who participate. The average distance travelled was 23.52 miles with an associated travel time of 80.55 minutes (in-state). The average age of the household and distance were related to freqency but their standard errors of estimate were such that the predictions might be widely at variance from reality.

7. Motorboating with Greater than 10 Horsepower

The average number of activity days for those households which participated in this activity was 30.81 activity days. The average distance travelled was 54.08 miles and the travel time was correspondingly, 67.17 minutes. A total explainable variance of about 5 percent was best accounted for by the distance factor, the number of children in a household between thirteen and seventeen years of age, lake surface acreage, and total acres

of a facility. These variables, however, only add marginal predictive ability to the explanation of household behavior and, therefore, are of limited utility.

8. Day Hiking

The average number of activity days for day hiking is 33.32. The average distance travelled to the facility is 40.146 miles and this is associated with a travel time of 65.73 minutes. Completed survey information for supply data helped to account for 93.7 percent of all household behavior. The best predictive variables were the number of developed campsites (b = 1.28; beta = .988; mean = 59.53), total developed acres (b = .038; beta = .041; mean = 8882.74), the number of nature trails (b = 4.84; beta = .057; mean = .743), the number of lodgeunits (b = -.746; beta = -.056; mean = 10.99) and the number of cabins (b = 1.40; beta = .043; mean = 5.24). A one unit supply change in the average facility at which these activity days took place would create the following changes per participating household in activity days: 1.28 activity days for an increase of one developed campsite, .038 activity days for an increase of one acre, 4.84 activity days for another nature trail, a loss of .746 activity days for each extra lodge unit and 1.40 extra activity days for each extra cabin.

9. Overnight Hiking

Demographic characteristics account for less than 3 percent of the activity days spent in overnight hiking; such hiking averages 15.29 activity days per household. The distance travelled is about 39.05 miles and the corresponding travel time averages 70.08 minutes (in-state). The regression

equation constant is 40.88 activity days. The best predictors are the variety index (b = 105.96; beta = .649; mean = .0186), the number of lakes (b = 1.804; beta = .432; mean = 3.25), the number of mooring slips ( b = -.122; beta = -.779; mean = 67.03), the number of developed campsites (b = .228; beta = .659; mean = 51.16), the number of launches (b = 1.032; beta = .328; mean = 5.57), and the number of O.R.V. trails (b = -1.529; beta = -.283; mean = .7614). For a one unit supply change in the average size facilities for which there was adequate supply data we would expect the following changes in per participating household activity days; 105.96 for variety, 1.804 for the number of developed campsites, 1.032 activity days for the number of launches, -.122 for the number of mooring slips, -1.529 activity days for the number of O.R.V. trails, and .288 activity days for the number of lakes.

10. Camping with an Organized Group

The average number of activity days for participating households for this activity is 18.73; distance travelled is 48.53 miles and travel time is 59.88 minutes (in-state). No significant variance could be accounted for by anything other than supply variables. They accounted for 31.2 percent of household behavior. The regression constant was 22.65; six variables were significantly associated with the frequency of participation. Length of residence at present address (b = .444; beta = .188), the number of beaches (b = 9.98; beta = .320; mean = .734), the number of mooring slips (b = .088; beta = .40; mean = 73.03), whether or not you were currently enrolled in school (b = 2.088; beta = .159; mean = 2.50), the potential multiple purpose trip index (b = -11.83, beta = -.253; mean = .217), and the attractiveness

index of potential multiple purpose trip behavior divided by travel time were the most useful predictors of frequency (b = 3530.24; beta = 3.27; mean = .0072). A one unit change in the number of beaches will increase activity days by 9.98 days per participating household at each facility; a one unit change in the number of mooring slips yields a .088 day increase at an average facility.

11. Camping Enroute

For each participating household, the average number of activity days spent in camping enroute is 13.46 activity days. The average distance travelled before participating in an activity of this type is 114.69 miles and an associated travel time of 129.79 minutes. Supply related variables help account for 20 percent of household behavior, up 19 percent over demographic characteristics. The single best predictor was the total number of developed acres (b = .094; beta = 1.264) with an average of 222.41 developed acres per facility. A one unit change in supply increases activity days by .094 and a one percent change in supply (2.22 acres) yields an increase of .2068 activity days. The multiple purpose trip indicators (including the indicator in which the index is divided by travel time) were other important variables, as was the number of launches (b = -2.62; beta = -1.31; mean = 5.428) and the number of nature trails (b = -16.04; beta = -1.047; mean = .446) and the number of backpacking trails (b = 8.91; beta = -1.31; mean = .553). A one unit supply change in the average quantity of these facilities at places for which supply data existed in our analyses results in the following activity day changes: -16.04 for nature trails; -2.62 activity days for launches, and 8.91 activity days increase for backpacking trails.

12. Camping You Can Drive In To

The average number of activity days is 23.90; distance travelled was 57.83 miles and the associated travel time was 77.57 minutes. Demographic variables accounted for less then three percent of household behavior and supply variables accounted for another 4 percent. The most important variables in the regression model were the number of developed campsites, the surface acreage of unrestricted lakes, the number of children in the household between six and twelve years of age and the potential for multiple purpose trips index. A one unit change in supply for the number of developed campsites increases activity days by 0.647 at a facility with about 108.95 campsites. A one unit supply change in the surface acreage of unrestricted lakes yields an increase of 9.310 activity days. The average surface acreage on unrestricted lakes was so small (.272) as to indicate that such lakes didn't exist at drive-in camping facilities in general.

13. Camping that you Can't Drive In To

The average number of activity days here was 19.80; the distance travelled was 67.58 miles and the associated travel time was 87.09 minutes (in-state). No significant variation could be accounted for in terms of social, demographic, or economic conditions although 24 percent of household behavior was correlated with supply characteristics. The variables most relevant to predicting the number of activity days for this type of recreation are the number of acres, the number of lakes, whether sailing is permitted, the number of totally developed acres and the number of O.R.V. trails. A one unit change in acres (mean = 13162.23) yields an increase of .00229 activity days. A one unit change

in the number of lakes (4.82) yields an increase of 5.284 activity days by 4.95. Increasing total developed acres by one unit (mean = 305.28) increases activity days by .07219 at facilities like the average one of this sample. Finally, increasing the number of O.R.V. trails by one unit (mean = 2.67) causes a decline in activity days by 3.54.

14. Bicycling

Neither demographic nor supply factors sufficiently correlate with recreational bicycling for the Department of Conservation to make any allocation decisions on the basis of factors incorporated in our research. Only three percent of the household behavior could be accounted for and most of this was related to the number of totally developed acres (b = 222.98; beta = .46; mean 52.70) in a facility and the number of beaches (b = 18.719; beta = 1.45; mean = 6.30) which were present. The average number of activity days of this activity were 57.28 and the distance travelled was 12.08 miles; 45.33 minutes of travel time (in-state). The regression constant was 20.23 activity days.

15. Horseback Riding

The average number of activity days for those who went horseback riding was 19.03; the distance travelled was 86.40 miles; and, the travel time was 140.15 minutes (in-state). The total variance accounted for was just under 10 percent of all household behavior with 5.4 percent being accounted for by household characteristics: number of children between zero and two, the length of residence at the present address, the length of residence in the town of residence.

16. Snowmobiling**

There was totally insufficient supply data for this activity to be meaningfully examined. The average number of household activity days was 56.83; the distance travelled 120.01 miles and the travel time was 158.87. Length of residence at current address and the multipurpose trip index were the only two characteristics which had any direct relationship with the frequency of snowmobiling.

17. Off Road Motorcycling

Inadequate supply data made this activity too problematic to interpret. The number of children between 6 and 12 years of age and the multi-purpose trip index were the only variables accounting for significant variation in household behavior in this activity; an activity in which between two and nine percent of household behavior is explainable. The average number of activity days for this activity is 49.32; the distance travelled is 33.30 miles and the associated travel time is 49.30 minutes.

18. Swimming at Lake Michigan**

The average number of activity days for participating households was 33.54 days; the average distance travelled in order to participate was 69.12 miles; and the average travel time was 90.21 minutes (in-state). Six percent of the data was accounted for by household characteristics, primarily the number of children between 6 and 12 years old and the number of children between 13 and 17 years old. The number of work hours in a week was the only other variable to account for any significant variation. Supply features were

invariant and, as a result, accounted for none of the variation in household behavior.

19. Beach Swimming Not at Lake Michigan

The average number of activity days for households participating in this activity was 35.96 days. The average distance travelled was 46.18 miles; the average travel time was 66.13 minutes (in-state). Demographic data accounted for less than 3 percent of household behavior and the most important variables were the number of children between 6 and 12 years old and the number of children between 13 and 17 years old. Distance was a particularly strong factor and for every one mile that facilities are located closer to a given population we would expect an increase of .049 activity days per household. For every one unit change in total acreage (mean = 30,506) of facilities which accommodate swimming, one would expect an increase of .00039 activity days per household. As the number of swimming pools (mean = 2.28) is increased at such facilities, one would expect an increase of 1.506 activity days and if one increased the number of O.R.V. trails (mean 6.58) by one unit at such facilities, we would expect a rise of .641 activity days.

20. Swimming at Pools

The average number of activity days was 70.55; the distance travelled was 10.02 miles and the travel time was 23.14 minutes. Supply variables accounted for 12 percent of household behavior out of total of 16 percent. Total acres (mean = 2951.1) and the number of unrestricted lakes (mean = 2.267), and the number of pools were the three most important variables and the children between ages 6 and 12 were the major demographic variable. A one unit change

in acreage yields an increase of .00855 activity days at these types of facilities; a one unit change in the number of pools yields a loss of 1.725 activity days and an increase in the number of unrestricted lakes increases activity days by 18.398 days per household.

21. Lodging with Kitchen Facilities

The average number of activity days is 16.186; the average distance travelled is 80.13 miles, the average travel time is 100.32 minutes. Supply do not account for any significant variation in household behavior by themselves. However, distance, the variety index (supply variables taken together) and the number of children between 0-2 and the number of children between 6 and 12 years of age account for 52.1 percent of all household variations in behavior. The mean variety index for this analysis was .4746. Between 9 and 11 activities could be done at the average facility and except for travel time, the variety was four to five times more important in predicting index household participation than other supply characteristics. Travel time to facilities with lodging units was about 5/6 as important as the variety index indicating a definite market area boundary for each facility with a large variety of activities and with lodging units.

22. Lodging Without Kitchen Facilities

The average number of activity days for this activity per household was 12.01. Statewide, the average household has 2.80 family members. Hence a bit more than four days of activity per person would be the expected quantity of participation. For facilities in Illinois the average time travelled to facilities was 128 minutes (108.9 miles). For all facilities including out-

of-state distinations, the average travel time was 483 minutes or roughly eight hours (415.7 miles). Demographic or population characteristics account for 9.56 percent of all variations in household behavior and the most highly correlated variables are the average age of the household (b = 1.25; beta = .077; mean = 32.95 yrs), the number of children three to five years old ( b = 50.37; beta = .0724) and the number of children in a household who are 6-12 years old (b = 13.47; beta = .0348). The education level of the household head is the most important socioeconomic characteristic (b = 4.178; beta = .1380); household's income level is only slightly less important (b = 384.98; beta = .1318). The most important supply characteristics as predictors of participation are the number of pools at the facilities (b = 12.966; beta = .5676; mean = .60), the number of horseback riding trails (b = -10.289; beta = -.238; mean = 1.0278), the number of nature trails (b = .925; beta = .019; mean = .278), the number of lodge units (b = .228, beta = .293; mean = 24.65), the number of cabins (b = .212; beta = .094, mean = 9.111) and the number of unrestricted surface acres of water for boating (b = -15.55; beta = -.385; mean = .7917). It is clear that families with young children tend to participate in this activity the least. The types of supply characteristics which correlate with participation appear to be those which are oriented towards amenities (pools) for children, a variety of overnight accommodations and less strenuous activities (nature trails). The regression coefficients indicate the average increase in activity days (participation) that results with an increment in the predictor variables. If the number of children in a household between 6 and 12 years old goes up by one, we can expect an additional 13.47 activity days of participation. If the number of horseback riding trails goes up by one we can expect a decline of 10.29 activity days,

thereby indicating that horseback riding is not associated with this activity. Where no lake or water acreage is present, no decline in household participation is experienced. Wherever lodge or cabin units are increased, an increase in activity days will occur. Additionally, wherever the number of pools and/or nature trails is increased, increase in participation will be experienced.

23. Off Road Driving

The average number of activity days (people times days) for this activity per household was 68.45 for facilities in Illinois. The average distance travelled to Illinois facilities was 29.3 miles and the average travel time was 41.6 minutes. The most important predictors of this activity were demographic characteristics: Percent male ($r = .27$), Children up to two years of age ($r = -.19$), Children six to twelve ($r = .39$), the number of workdays in a week ($r = .30$), the number of work hours in a week ($r = .33$), and the size of town in which the respondent grew up ($r = .43$). The relationships between the variables, however, was highly nonmonotonic and nonlinear and as a result, regression coefficients and beta coefficients were likely to have little utility. In any case, the demographic characteristics rather than the supply features proved to have the highest simple correlations (r) with the number of activity days of participation.

## POTENTIAL MULTIPLE PURPOSE RECREATION: GROUPS OF SIMILAR ACTIVITIES (A)

In this section, we discuss some of the ways in which the twenty-three outdoor recreation activities are interrelated. We do this for the HDSA, the urban areas of Madison and St. Clair Counties, and Governor's Region 4 of Illinois. First we correlate the patterns of participation of households. That is, we correlated whether or not households participate in one activity with whether or not they have participated in other activities. Table 34 shows the patterns of correlations among the twenty-three activities in the six town HDSA. Note that activity 16 (snowmobiling) has a value of 99.00 instead of correlations coefficients with other activities. This is because no family in this inner HDSA area participated in this activity. Table 35 shows the pattern of intercorrelations of activities for the twenty-three activities for the urban areas of Madison and St. Clair Counties and Table 36 shows the pattern of intercorrelations for the activities for residents of Region 4. If one wanted to know to what degree households participated in any two specific activities one need only examine the correlation coefficient (R) of any pair of activities and then multiply it by itself ($R \times R = R^2$). The Coefficient of Determination is a percentage measure of the degree to which any two activities are done by the households of the various study areas. Thus, from Table 34, the degree to which households participated in both day hiking (Var 08) and the use of lodging units without kitchens (Var 23) was $0.2067 \times 0.2067 = .0427 \times 100 = 4.27$ percent. Thus, 4.27 percent of the

# IDENTIFICATION OF ACTIVITIES

| Activity | Variable Number |
|---|---|
| Canoe-Rivers & Streams | Var. 01 |
| Canoe-Lakes & Ponds | Var. 02 |
| Sailing on L.M. | Var. 03 |
| Sailing Except L.M. | Var. 04 |
| Motorboating, 10 HP or Less | Var. 05 |
| Motorboating on L.M. | Var. 06 |
| Motorboating, 10 HP or More | Var. 07 |
| Day Hiking | Var. 08 |
| Overnight Camping | Var. 09 |
| Camping with an Org. Group | Var. 10 |
| Camping Enroute | Var. 11 |
| Primitive Camping | Var. 12 |
| Camping You Can Drive Into | Var. 13 |
| Recreational Bicycling | Var. 14 |
| Horseback Riding | Var. 15 |
| Snowmobiling | Var. 16 |
| Off-Road Motorcycling | Var. 17 |
| Off-Road Driving | Var. 18 |
| Swimming at Lake Michigan | Var. 19 |
| Beach Swimming not at L.M. | Var. 20 |
| Swimming at Pools | Var. 21 |
| Lodging with Kitchen Fac. | Var. 22 |
| Lodging w/out Kitchen Fac. | Var. 23 |

Table 34.
Intercorrelations of Recreation Activities:
Harding Ditch Study Area

| | VARC1 | VARC2 | VARC3 | VARC4 | VARC5 | VARC6 | VARC7 | VARC8 | VARC9 | VAR10 |
|---|---|---|---|---|---|---|---|---|---|---|
| VARC1 | 1.CCCCC | -C.01519 | -0.01519 | -0.02158 | C.15577 | -C.02158 | C.1C636 | C.C5572 | -0.04129 | -0.04129 |
| VARC2 | -C.01519 | 1.CCCCC | -0.CC870 | -0.01235 | -0.02704 | -0.01235 | 0.25170 | C.19275 | -0.02363 | 0.36797 |
| VARC3 | -0.01519 | -0.CC870 | 1.CCCCC | C.70403 | 0.22153 | -C.01235 | -C.03455 | C.19275 | -0.02363 | -C.02363 |
| VARC4 | -C.02158 | -C.01235 | C.70403 | 1.CCCCC | 0.20914 | -C.01754 | 0.15422 | C.1C486 | -0.03357 | -0.03357 |
| VARC5 | 0.15577 | -0.027C4 | C.22153 | C.20914 | 1.CCCCC | -0.03841 | -C.CC853 | C.1EE45 | C.19716 | C.19716 |
| VARC6 | -C.02158 | -0.01235 | -C.01235 | -0.C1754 | -C.03841 | 1.CCCCC | C.15422 | -C.06408 | -0.03357 | -0.03357 |
| VARC7 | 0.10636 | C.25170 | -C.03455 | 0.15422 | -C.00853 | C.15422 | 1.CCCCC | C.C5C78 | -0.05385 | C.12837 |
| VARC8 | C.C5972 | C.19275 | C.19275 | 0.1C486 | 0.18849 | -C.06408 | C.C5C78 | 1.CCCCC | 0.15444 | C.33913 |
| VARC9 | -0.04129 | -0.02363 | -0.02363 | -0.03357 | C.19716 | -C.03357 | -C.05385 | C.15444 | 1.CCCCC | C.39187 |
| VAR10 | -C.04129 | C.36797 | -C.02363 | -0.03357 | 0.19716 | -C.03357 | C.12837 | C.33513 | 0.39187 | 1.CCCCC |
| VAR11 | C.20718 | 0.39927 | -0.02178 | -0.03C93 | 0.07777 | -C.03C93 | C.03296 | C.38347 | 0.10428 | 0.10428 |
| VAR12 | C.31563 | -C.01519 | -C.01519 | -0.02158 | -C.04726 | -C.02158 | C.27308 | C.19826 | C.18679 | C.18679 |
| VAR13 | C.31901 | -C.04763 | -0.04763 | C.C5584 | C.09052 | C.09584 | C.33339 | C.35005 | 0.22805 | 0.13868 |
| VAR14 | C.C6941 | C.20430 | 0.29019 | 0.18318 | 0.29417 | -C.06046 | C.11112 | C.33558 | 0.26765 | C.45937 |
| VAR15 | 0.13264 | C.28810 | C.28810 | 0.18318 | C.23610 | C.40522 | C.42203 | C.14364 | C.04154 | C.04154 |
| VAR16 | 99.CCCCC | 99.CCCCC | 99.CCCCC | 99.CCCCC | 99.CCCCC | 99.CCCCC | 99.CCCCC | 99.CCCCC | 99.CCCCC | 99.CCCCC |
| VAR17 | 0.13264 | -C.03018 | C.28810 | 0.18318 | 0.23610 | C.18318 | 0.33171 | C.29376 | C.04154 | -C.CE2C2 |
| VAR18 | -0.01519 | -0.CC870 | -C.CC870 | -0.01235 | C.32153 | -C.01235 | -0.03455 | C.19275 | C.36797 | 0.36797 |
| VAR19 | -0.02158 | -0.01235 | C.70403 | 0.49123 | C.20914 | -C.01754 | -0.04907 | 0.27379 | -C.03357 | -C.03357 |
| VAR20 | C.28866 | C.16532 | C.16532 | 0.23481 | 0.28824 | -C.07471 | C.34759 | C.34377 | C.11CEE | C.11CEE |
| VAR21 | C.CC200 | 0.13360 | C.13360 | C.C4866 | C.20953 | C.04866 | C.13610 | C.31828 | 0.13166 | C.36307 |
| VAR22 | C.28646 | 0.26248 | C.26248 | C.16285 | 0.30558 | -C.04706 | 0.20394 | C.31610 | 0.25426 | C.48315 |
| VAR23 | C.C5907 | 0.24157 | -0.03594 | -C.05104 | C.27238 | -C.05104 | C.25155 | C.20678 | 0.11812 | C.44180 |

| | VAR11 | VAR12 | VAR13 | VAR14 | VAR15 | VAR16 | VAR17 | VAR18 | VAR19 | VAR20 |
|---|---|---|---|---|---|---|---|---|---|---|
| VARC1 | C.20718 | C.31563 | C.31901 | C.C6941 | 0.13264 | 99.CCCCC | 0.13264 | -C.C1519 | -0.02158 | C.28866 |
| VARC2 | C.39927 | -0.01519 | -C.04763 | 0.20430 | C.28810 | 99.CCCCC | -0.03018 | -0.CCC70 | -0.01235 | 0.16532 |
| VARC3 | -C.02178 | -C.01519 | -C.04763 | 0.20430 | C.28810 | 99.CCCCC | C.28810 | -C.CCC70 | C.70403 | C.16532 |
| VARC4 | -C.03093 | -C.02158 | C.C5584 | 0.29019 | C.18318 | 99.CCCCC | C.18318 | -C.01235 | C.49123 | C.23481 |
| VARC5 | C.07777 | -0.04726 | C.09052 | 0.29417 | 0.23610 | 99.CCCCC | C.23610 | C.32153 | 0.20914 | 0.28824 |
| VARC6 | -0.03093 | -C.02158 | C.C9584 | -0.06046 | C.40522 | 99.CCCCC | 0.18318 | -C.01235 | -C.01754 | -C.07471 |
| VARC7 | 0.03296 | C.27308 | 0.33339 | 0.11112 | 0.42203 | 99.CCCCC | C.33171 | -C.03455 | -0.04907 | 0.34759 |
| VARC8 | C.38347 | 0.19826 | C.35005 | 0.33558 | 0.14364 | 99.CCCCC | 0.29376 | C.19275 | 0.27379 | 0.34377 |
| VAR09 | C.10428 | C.18679 | C.22805 | C.26765 | 0.04154 | 99.CCCCC | 0.04154 | C.36797 | -0.03357 | C.11CEE |
| VAR10 | 0.10428 | C.18679 | C.13868 | C.45937 | 0.04154 | 99.CCCCC | -0.08202 | C.36797 | -0.03357 | C.11CEE |
| VAR11 | 1.CCCCC | -C.038C5 | C.26508 | 0.20254 | C.19013 | 99.CCCCC | C.32299 | -C.02178 | -0.03093 | C.32306 |
| VAR12 | -C.038C5 | 1.CCCCC | C.18494 | 0.C6941 | 0.13264 | 99.CCCCC | C.31803 | -C.C1519 | -0.02158 | C.28866 |
| VAR13 | C.26508 | C.18494 | 1.CCCCC | 0.16125 | C.27052 | 99.CCCCC | 0.19788 | C.18257 | -0.06766 | 0.45766 |
| VAR14 | 0.20254 | C.C6941 | C.16125 | 1.CCCCC | 0.24175 | 99.CCCCC | 0.24175 | C.20430 | 0.11487 | 0.32919 |

Table 34 (Cont'd)

| | VAR11 | VAR12 | VAR13 | VAR14 | VAR15 | VAR16 | VAR17 | VAR18 | VAR19 | VAR20 |
|---|---|---|---|---|---|---|---|---|---|---|
| VAR15 | C.19013 | C.13264 | C.27052 | 0.24175 | 1.00000 | 99.00000 | C.49784 | -C.03018 | C.18318 | C.29876 |
| VAR16 | 99.00000 | 99.00000 | 99.00000 | 99.00000 | 99.00000 | 1.00000 | 99.00000 | 99.00000 | 99.00000 | 99.00000 |
| VAR17 | C.32299 | C.31803 | C.19788 | 0.24175 | C.49784 | 99.00000 | 1.00000 | -C.03018 | C.18318 | C.36752 |
| VAR18 | -C.02178 | -C.01519 | C.18257 | C.20430 | -C.03018 | 99.00000 | -C.03018 | 1.00000 | -C.01235 | C.08005 |
| VAR19 | -C.03093 | -C.02158 | -0.06765 | 0.11487 | 0.18318 | 99.00000 | 0.18318 | -C.01235 | 1.00000 | -C.05260 |
| VAR20 | C.32308 | C.28866 | C.45788 | 0.32519 | C.29876 | 99.00000 | C.36752 | -C.05260 | C.08005 | 1.00000 |
| VAR21 | 0.08580 | 0.11772 | C.14229 | 0.31355 | C.15025 | 99.00000 | 0.21294 | 0.13360 | 0.04866 | 0.20722 |
| VAR22 | C.04042 | 0.28646 | C.22333 | C.48856 | 0.35140 | 99.00000 | C.35140 | C.26248 | C.16289 | C.31050 |
| VAR23 | C.14201 | -C.06279 | C.24713 | C.23219 | 0.22603 | 99.00000 | C.05065 | C.24197 | -C.05104 | C.14285 |

| | VAR21 | VAR22 | VAR23 |
|---|---|---|---|
| VAR01 | C.00200 | C.28646 | C.09907 |
| VAR02 | C.13360 | C.26248 | C.24197 |
| VAR03 | C.13360 | C.26248 | -C.03594 |
| VAR04 | C.04866 | C.16289 | -C.05104 |
| VAR05 | 0.20953 | 0.30558 | 0.27238 |
| VAR06 | C.04866 | -C.04706 | -C.05104 |
| VAR07 | C.13610 | 0.20394 | C.25155 |
| VAR08 | C.31828 | C.31610 | C.20678 |
| VAR09 | C.13166 | C.25426 | C.11812 |
| VAR10 | C.36307 | C.48379 | C.44180 |
| VAR11 | C.08580 | C.04042 | C.14201 |
| VAR12 | C.11772 | 0.28646 | -0.06279 |
| VAR13 | C.14229 | C.22333 | 0.24713 |
| VAR14 | C.31355 | C.48856 | C.23219 |
| VAR15 | C.15025 | 0.35140 | 0.22603 |
| VAR16 | 99.00000 | 99.00000 | 99.00000 |
| VAR17 | 0.21294 | C.35140 | C.05065 |
| VAR18 | 0.13360 | C.26248 | 0.24197 |
| VAR19 | C.04866 | C.16289 | -C.05104 |
| VAR20 | C.20722 | C.31050 | 0.14285 |
| VAR21 | 1.00000 | C.39253 | 0.27842 |
| VAR22 | C.39253 | 1.00000 | C.18887 |
| VAR23 | 0.27842 | C.18887 | 1.00000 |

CORRELATION COEFFICIENT FOR VARIABLES VAR16 WITH VAR01 = 99.00000. FACTOR ANALYSIS WILL NOT BE DONE.
TO BE SAFE, CHECK REST OF MATRIX BEFORE RE-RUNNING FACTOR

Table 35.
Intercorrelations of Recreation Activities:
Madison and St. Clair Counties

| | VARC1 | VARC2 | VARC3 | VARC4 | VARC5 | VARC6 | VARC7 | VARC8 | VARC9 | VAR10 |
|---|---|---|---|---|---|---|---|---|---|---|
| VARC1 | 1.CCCCC | C.27352 | C.06445 | C.12149 | C.17226 | C.16175 | C.21494 | C.24220 | C.14864 | C.23017 |
| VAR02 | C.27352 | 1.CCCCC | C.14573 | C.12902 | C.11390 | C.07207 | C.16417 | C.25000 | C.21381 | C.26456 |
| VARC3 | C.06445 | C.14573 | 1.CCCCC | C.31416 | C.06445 | -C.00859 | C.02172 | C.07133 | C.05174 | C.07474 |
| VARC4 | C.12149 | C.12902 | C.31416 | 1.CCCCC | C.03874 | C.07612 | C.12013 | C.05174 | C.06927 | C.05112 |
| VARC5 | C.17226 | C.11390 | C.06445 | C.03874 | 1.CCCCC | C.06262 | C.05308 | C.05931 | C.09422 | C.06312 |
| VARC6 | C.16175 | C.07207 | -C.00859 | C.07612 | C.06262 | 1.CCCCC | C.10477 | C.09215 | C.09564 | C.07581 |
| VARC7 | C.21494 | C.16417 | C.02172 | C.12013 | C.05308 | C.10477 | 1.CCCCC | C.17171 | C.08374 | C.15275 |
| VARC8 | C.24220 | C.25000 | C.07133 | C.05174 | C.05931 | C.09215 | C.17171 | 1.CCCCC | C.27576 | C.28262 |
| VARC9 | C.14864 | C.21381 | C.05045 | C.06927 | C.09422 | C.09564 | C.08374 | C.27576 | 1.CCCCC | C.25668 |
| VAR10 | C.23017 | C.26456 | C.07474 | C.05112 | C.06312 | C.07581 | C.15275 | C.28262 | C.25668 | 1.CCCCC |
| VAR11 | C.10986 | C.15369 | C.08509 | C.06216 | C.06172 | C.02958 | C.05160 | C.07211 | C.17161 | C.13464 |
| VAR12 | C.15282 | C.15698 | C.08680 | C.16547 | C.13999 | C.21120 | C.19880 | C.14028 | C.24170 | C.22531 |
| VAR13 | C.28320 | C.16745 | C.00676 | C.03085 | C.10841 | C.07166 | C.31307 | C.24246 | C.21405 | C.20366 |
| VAR14 | C.07514 | C.03598 | C.10972 | C.10831 | C.09266 | C.15114 | C.15330 | C.29045 | C.12776 | C.20145 |
| VAR15 | C.12292 | C.07089 | C.14640 | C.07657 | C.10153 | C.15746 | C.21959 | C.16231 | C.06312 | C.10574 |
| VAR16 | C.10543 | C.10750 | -C.00638 | -C.01339 | C.03916 | C.13969 | C.04301 | C.12077 | C.06178 | C.04825 |
| VAR17 | C.17566 | C.11588 | C.15168 | C.08174 | C.15367 | C.01392 | C.20516 | C.21939 | C.09649 | C.17115 |
| VAR18 | C.06839 | C.11707 | C.14016 | C.04590 | C.06839 | -C.01940 | C.10119 | C.13618 | C.20428 | C.08427 |
| VAR19 | C.17572 | C.17481 | C.60585 | C.18256 | C.12319 | C.34446 | C.04745 | C.10566 | C.17015 | C.08420 |
| VAR20 | C.28710 | C.13867 | C.05631 | C.05216 | C.16978 | C.00903 | C.42235 | C.32725 | C.15818 | C.22450 |
| VAR21 | C.14436 | C.07776 | C.04987 | C.06455 | C.10633 | C.11566 | C.20385 | C.32058 | C.21692 | C.19968 |
| VAR22 | C.17330 | C.19130 | C.10708 | C.00626 | C.17330 | C.10788 | C.22552 | C.22552 | C.18721 | C.17572 |
| VAR23 | C.11533 | C.04687 | C.04759 | C.05271 | C.11533 | C.04045 | C.15408 | C.19574 | C.10234 | C.20893 |

| | VAR11 | VAR12 | VAR13 | VAR14 | VAR15 | VAR16 | VAR17 | VAR18 | VAR19 | VAR20 |
|---|---|---|---|---|---|---|---|---|---|---|
| VAR01 | C.10986 | C.15282 | C.28320 | C.07514 | C.12292 | C.10543 | C.17566 | C.06839 | C.17572 | C.28710 |
| VAR02 | C.15369 | C.15698 | C.16745 | C.03598 | C.07089 | C.10750 | C.11588 | C.11707 | C.17481 | C.13867 |
| VAR03 | C.08509 | C.08680 | C.00676 | C.10972 | C.14640 | -C.00638 | C.15168 | C.14016 | C.60585 | C.05631 |
| VAR04 | C.06316 | C.16547 | C.03085 | C.10831 | C.07657 | -C.01339 | C.08174 | C.04590 | C.18256 | C.05216 |
| VAR05 | C.06172 | C.13999 | C.13841 | C.09266 | C.10153 | C.03916 | C.15367 | C.06839 | C.12319 | C.16978 |
| VAR06 | C.02958 | C.21120 | C.07166 | C.15114 | C.15746 | C.13969 | C.01392 | -C.01940 | C.34446 | C.00903 |
| VAR07 | C.05160 | C.19880 | C.31307 | C.15330 | C.21959 | C.04301 | C.20516 | C.10119 | C.04745 | C.42235 |
| VAR08 | C.07211 | C.14028 | C.24246 | C.29045 | C.16231 | C.12077 | C.21939 | C.13618 | C.10566 | C.32725 |
| VAR09 | C.17161 | C.24170 | C.21405 | C.12776 | C.06312 | C.06178 | C.09649 | C.20428 | C.17015 | C.15818 |
| VAR10 | C.13464 | C.22531 | C.20366 | C.20145 | C.10574 | C.04825 | C.17115 | C.08427 | C.08420 | C.22450 |
| VAR11 | 1.CCCCC | C.09993 | C.30141 | C.05104 | C.02831 | -C.02205 | C.13862 | C.09990 | C.09765 | C.18419 |
| VAR12 | C.09993 | 1.CCCCC | C.15069 | C.20331 | C.05867 | C.11606 | C.14525 | C.22726 | C.15952 |
| VAR13 | C.30141 | C.15069 | 1.CCCCC | C.14020 | C.14141 | C.06214 | C.15683 | C.06165 | C.09340 | C.44885 |
| VAR14 | C.05104 | C.20331 | C.14020 | 1.CCCCC | C.20685 | C.07083 | C.11356 | -C.00041 | C.12360 | C.23523 |

Table 35 (Cont'd)

| | VAR11 | VAR12 | VAR13 | VAR14 | VAR15 | VAR16 | VAR17 | VAR18 | VAR19 | VAR20 |
|---|---|---|---|---|---|---|---|---|---|---|
| VAR15 | 0.02831 | 0.05687 | 0.14141 | 0.20685 | 1.00000 | 0.10251 | 0.16909 | 0.02742 | 0.17126 | 0.14631 |
| VAR16 | -0.02205 | 0.05967 | 0.06214 | 0.07083 | 0.10251 | 1.00000 | 0.10656 | -0.01441 | 0.14935 | 0.01993 |
| VAR17 | 0.13662 | 0.11606 | 0.15683 | 0.11356 | 0.16909 | 0.10656 | 1.00000 | 0.18680 | 0.12502 | 0.25423 |
| VAR18 | 0.09990 | 0.14925 | 0.06189 | -0.00041 | 0.02742 | -0.01441 | 0.18680 | 1.00000 | 0.07477 | 0.17335 |
| VAR19 | 0.09765 | 0.22726 | 0.05340 | 0.12360 | 0.17126 | 0.14935 | 0.12502 | 0.07477 | 1.00000 | 0.01898 |
| VAR20 | 0.18419 | 0.15992 | 0.44885 | 0.23523 | 0.14631 | 0.01993 | 0.25423 | 0.17335 | 0.01898 | 1.00000 |
| VAR21 | 0.13193 | 0.18502 | 0.21596 | 0.20139 | 0.19580 | 0.09021 | 0.16274 | 0.11264 | 0.10216 | 0.25944 |
| VAR22 | 0.04683 | 0.17594 | 0.09776 | 0.20246 | 0.14857 | 0.12097 | 0.15991 | 0.11959 | 0.12011 | 0.23274 |
| VAR23 | 0.15704 | 0.04892 | 0.17374 | 0.11194 | 0.10904 | 0.08044 | 0.06217 | 0.04148 | 0.04809 | 0.13084 |

| | VAR21 | VAR22 | VAR23 |
|---|---|---|---|
| VAR01 | 0.14436 | 0.17330 | 0.11533 |
| VAR02 | 0.07776 | 0.19130 | 0.04587 |
| VAR03 | 0.04987 | 0.10708 | 0.04759 |
| VAR04 | 0.04455 | 0.08628 | 0.05271 |
| VAR05 | 0.10633 | 0.17330 | 0.11533 |
| VAR06 | 0.11566 | 0.10788 | 0.04045 |
| VAR07 | 0.20385 | 0.22532 | 0.15408 |
| VAR08 | 0.32058 | 0.25592 | 0.19574 |
| VAR09 | 0.21692 | 0.18721 | 0.10234 |
| VAR10 | 0.19968 | 0.17572 | 0.20893 |
| VAR11 | 0.13193 | 0.04683 | 0.15704 |
| VAR12 | 0.18502 | 0.17594 | 0.04892 |
| VAR13 | 0.21596 | 0.09776 | 0.17374 |
| VAR14 | 0.20139 | 0.20246 | 0.11194 |
| VAR15 | 0.19580 | 0.14857 | 0.10904 |
| VAR16 | 0.09021 | 0.12097 | 0.08044 |
| VAR17 | 0.16274 | 0.15991 | 0.06217 |
| VAR18 | 0.11264 | 0.11959 | 0.04148 |
| VAR19 | 0.10216 | 0.12011 | 0.04809 |
| VAR20 | 0.25944 | 0.23274 | 0.13084 |
| VAR21 | 1.00000 | 0.22852 | 0.21047 |
| VAR22 | 0.22852 | 1.00000 | 0.13463 |
| VAR23 | 0.21047 | 0.13463 | 1.00000 |

DETERMINANT OF CORRELATION MATRIX = 0.02277741 0.22777427D-011

Table 36.
Intercorrelations of Recreation Activities:
Governor's Region 4

| | VAR01 | VAR02 | VAR03 | VAR04 | VAR05 | VAR06 | VAR07 | VAR08 | VAR09 | VAR10 |
|---|---|---|---|---|---|---|---|---|---|---|
| VAR01 | 1.00000 | 0.21281 | 0.04965 | 0.09476 | 0.10909 | 0.14433 | 0.19677 | 0.21331 | 0.14837 | 0.22128 |
| VAR02 | 0.21281 | 1.00000 | 0.22189 | 0.09132 | 0.11705 | 0.05670 | 0.11747 | 0.20348 | 0.20077 | 0.20606 |
| VAR03 | 0.04965 | 0.22189 | 1.00000 | 0.23548 | 0.03742 | -0.00780 | 0.04890 | 0.08594 | 0.15340 | 0.05800 |
| VAR04 | 0.09476 | 0.09132 | 0.23548 | 1.00000 | 0.04108 | 0.06178 | 0.11207 | 0.04163 | 0.05076 | 0.03768 |
| VAR05 | 0.10909 | 0.11705 | 0.03742 | 0.04108 | 1.00000 | 0.07843 | 0.01559 | 0.06062 | 0.07085 | 0.02835 |
| VAR06 | 0.14433 | 0.05670 | -0.00780 | 0.06178 | 0.07843 | 1.00000 | 0.10472 | 0.07053 | 0.08285 | 0.06814 |
| VAR07 | 0.19677 | 0.11747 | 0.04890 | 0.11207 | 0.01559 | 0.10472 | 1.00000 | 0.12956 | 0.07294 | 0.11459 |
| VAR08 | 0.21331 | 0.20348 | 0.08594 | 0.04163 | 0.06062 | 0.07053 | 0.12956 | 1.00000 | 0.27034 | 0.24983 |
| VAR09 | 0.14837 | 0.20077 | 0.15340 | 0.05076 | 0.07085 | 0.08285 | 0.07294 | 0.27034 | 1.00000 | 0.24960 |
| VAR10 | 0.22128 | 0.20606 | 0.05800 | 0.03768 | 0.02835 | 0.06814 | 0.11459 | 0.24983 | 0.24960 | 1.00000 |
| VAR11 | 0.08614 | 0.14552 | 0.14054 | 0.04248 | 0.01786 | 0.02365 | 0.07749 | 0.20771 | 0.15961 | 0.10662 |
| VAR12 | 0.17919 | 0.11336 | 0.06421 | 0.12363 | 0.09863 | 0.17839 | 0.16707 | 0.11247 | 0.19264 | 0.23219 |
| VAR13 | 0.25407 | 0.12491 | 0.03604 | 0.02672 | 0.09511 | 0.08221 | 0.29166 | 0.30881 | 0.19789 | 0.20372 |
| VAR14 | 0.07110 | 0.01550 | 0.07963 | 0.07471 | 0.05574 | 0.12638 | 0.11892 | 0.28311 | 0.09591 | 0.16122 |
| VAR15 | 0.09151 | 0.10056 | 0.16933 | 0.04925 | 0.10007 | 0.12769 | 0.17765 | 0.14896 | 0.06231 | 0.09691 |
| VAR16 | 0.08901 | 0.17657 | -0.00603 | -0.01252 | 0.02135 | 0.12081 | 0.02503 | 0.08843 | 0.05023 | 0.04034 |
| VAR17 | 0.18089 | 0.10192 | 0.10588 | 0.08149 | 0.08691 | 0.00734 | 0.22466 | 0.16297 | 0.06370 | 0.04119 |
| VAR18 | 0.07701 | 0.07760 | 0.09943 | 0.03054 | 0.05356 | -0.01806 | 0.08496 | 0.13037 | 0.15065 | 0.09278 |
| VAR19 | 0.15525 | 0.13935 | 0.49661 | 0.14894 | 0.12653 | 0.30821 | 0.03071 | 0.08075 | 0.14622 | 0.07468 |
| VAR20 | 0.25391 | 0.11343 | 0.06575 | 0.07455 | 0.14878 | 0.02539 | 0.41950 | 0.29678 | 0.14247 | 0.18525 |
| VAR21 | 0.12692 | 0.06574 | 0.06333 | 0.02652 | 0.11488 | 0.11236 | 0.18996 | 0.27155 | 0.18722 | 0.18663 |
| VAR22 | 0.13138 | 0.12954 | 0.07511 | -0.00719 | 0.15917 | 0.11519 | 0.21379 | 0.20747 | 0.13837 | 0.14905 |
| VAR23 | 0.08702 | 0.04081 | 0.08023 | 0.02347 | 0.10807 | 0.05970 | 0.13042 | 0.16315 | 0.13265 | 0.14666 |

| | VAR11 | VAR12 | VAR13 | VAR14 | VAR15 | VAR16 | VAR17 | VAR18 | VAR19 | VAR20 |
|---|---|---|---|---|---|---|---|---|---|---|
| VAR01 | 0.08614 | 0.17919 | 0.25407 | 0.07110 | 0.09151 | 0.08901 | 0.18089 | 0.07701 | 0.15525 | 0.25391 |
| VAR02 | 0.14552 | 0.11336 | 0.12491 | 0.01550 | 0.10056 | 0.17657 | 0.10192 | 0.07760 | 0.13935 | 0.11343 |
| VAR03 | 0.14054 | 0.06421 | 0.03604 | 0.07963 | 0.16933 | -0.00603 | 0.10588 | 0.09943 | 0.49661 | 0.06575 |
| VAR04 | 0.04248 | 0.12363 | 0.02672 | 0.07471 | 0.04925 | -0.01252 | 0.08149 | 0.03054 | 0.14894 | 0.07455 |
| VAR05 | 0.01786 | 0.09863 | 0.09511 | 0.05574 | 0.10007 | 0.02135 | 0.08691 | 0.05356 | 0.12653 | 0.14878 |
| VAR06 | 0.02365 | 0.17839 | 0.08221 | 0.12638 | 0.12769 | 0.12081 | 0.00734 | -0.01806 | 0.30821 | 0.02539 |
| VAR07 | 0.07749 | 0.16707 | 0.29166 | 0.11892 | 0.17765 | 0.02503 | 0.22466 | 0.08496 | 0.03071 | 0.41950 |
| VAR08 | 0.20771 | 0.11247 | 0.30881 | 0.28311 | 0.14896 | 0.08843 | 0.16297 | 0.13037 | 0.08075 | 0.29678 |
| VAR09 | 0.15961 | 0.19264 | 0.19789 | 0.09591 | 0.06231 | 0.05023 | 0.06370 | 0.15065 | 0.14622 | 0.14247 |
| VAR10 | 0.10662 | 0.23219 | 0.20372 | 0.16122 | 0.09691 | 0.04034 | 0.04119 | 0.09278 | 0.07468 | 0.18525 |
| VAR11 | 1.00000 | 0.09652 | 0.28740 | 0.04374 | 0.04813 | -0.02025 | 0.10943 | 0.10031 | 0.08018 | 0.18337 |
| VAR12 | 0.09652 | 1.00000 | 0.13699 | 0.16768 | 0.07289 | 0.04591 | 0.13570 | 0.10441 | 0.19061 | 0.14571 |
| VAR13 | 0.28740 | 0.13699 | 1.00000 | 0.12747 | 0.15480 | 0.04419 | 0.14854 | 0.05738 | 0.04105 | 0.45365 |
| VAR14 | 0.04374 | 0.16768 | 0.12747 | 1.00000 | 0.19463 | 0.05429 | 0.10317 | 0.00892 | 0.10208 | 0.22558 |

Table 36 (Cont'd)

| | VAR11 | VAR12 | VAR13 | VAR14 | VAR15 | VAR16 | VAR17 | VAR18 | VAR19 | VAR20 |
|---|---|---|---|---|---|---|---|---|---|---|
| VAR15 | 0.04813 | 0.07289 | 0.15480 | 0.19463 | 1.00000 | 0.12980 | 0.15228 | -0.00712 | 0.13804 | 0.13469 |
| VAR16 | -0.02025 | 0.04591 | 0.04419 | 0.05429 | 0.12980 | 1.00000 | 0.13106 | -0.01395 | 0.12828 | 0.00706 |
| VAR17 | 0.10943 | 0.13570 | 0.14854 | 0.10217 | 0.15228 | 0.13106 | 1.00000 | 0.20520 | 0.09671 | 0.22639 |
| VAR18 | 0.10031 | 0.10441 | 0.05738 | 0.00852 | 0.00712 | -0.01395 | 0.20520 | 1.00000 | 0.05658 | 0.13168 |
| VAR19 | 0.09018 | 0.19061 | 0.04105 | 0.10208 | 0.13804 | 0.12828 | 0.09671 | 0.05658 | 1.00000 | 0.03434 |
| VAR20 | 0.18337 | 0.14571 | 0.45369 | 0.22558 | 0.13469 | 0.00706 | 0.22639 | 0.13168 | 0.03434 | 1.00000 |
| VAR21 | 0.12809 | 0.16271 | 0.23767 | 0.18708 | 0.18702 | 0.09293 | 0.16287 | 0.10131 | 0.07654 | 0.26282 |
| VAR22 | 0.08378 | 0.15579 | 0.13011 | 0.19821 | 0.14090 | 0.09210 | 0.13054 | 0.07196 | 0.05583 | 0.23912 |
| VAR23 | 0.14471 | 0.03300 | 0.14699 | 0.08330 | 0.10235 | 0.05484 | 0.05051 | 0.00957 | 0.03166 | 0.15567 |

| | VAR21 | VAR22 | VAR23 |
|---|---|---|---|
| VAR01 | 0.12692 | 0.13139 | 0.09702 |
| VAR02 | 0.06574 | 0.12954 | 0.04081 |
| VAR03 | 0.06323 | 0.07511 | 0.09023 |
| VAR04 | 0.02692 | -0.00719 | 0.02347 |
| VAR05 | 0.11438 | 0.15517 | 0.10307 |
| VAR06 | 0.11236 | 0.11919 | 0.05970 |
| VAR07 | 0.18996 | 0.21379 | 0.13042 |
| VAR08 | 0.27155 | 0.20747 | 0.16315 |
| VAR09 | 0.18722 | 0.13837 | 0.13289 |
| VAR10 | 0.19663 | 0.14905 | 0.14686 |
| VAR11 | 0.12809 | 0.08378 | 0.14471 |
| VAR12 | 0.16271 | 0.15579 | 0.03300 |
| VAR13 | 0.23767 | 0.13011 | 0.14699 |
| VAR14 | 0.18708 | 0.19821 | 0.08330 |
| VAR15 | 0.18702 | 0.14090 | 0.10235 |
| VAR16 | 0.09293 | 0.09210 | 0.05484 |
| VAR17 | 0.16287 | 0.13054 | 0.05051 |
| VAR18 | 0.10131 | 0.07196 | 0.00957 |
| VAR19 | 0.07654 | 0.05583 | 0.03166 |
| VAR20 | 0.26282 | 0.23912 | 0.15567 |
| VAR21 | 1.00000 | 0.22235 | 0.19839 |
| VAR22 | 0.22235 | 1.00000 | 0.16794 |
| VAR23 | 0.19839 | 0.16794 | 1.00000 |

DETERMINANT OF CORRELATION MATRIX = 0.047177C( 0.47176958D-C1)

households in the study area participated in both day hiking during 1976 and the use of lodging facilities without kitchens. From Table 35 the correlation coefficient between these two activities, Var 08 and Var 23, was 0.1957. Thus 0.1957 x 0.1957 = 0.383 x 100 = 3.83 percent of residents in the urban areas sampled in the two counties participated in both day hiking and lodging without kitchens. When the errors of proportions for the 95 percent and the 99 percent confidence levels are taken into consideration (from Table 32) and "t-tests" performed, there are no statistically significant differences between the patterns of activity co-variation from household to household. Furthermore, statistically significant differences in proportions of co-variation between activities do not exist when the data in Table 36 are compared to the correlations of Table 35.

Nevertheless, when one tries to unravel the overall patterns of inter-correlation based on the 253 correlation coefficients of each table the task becomes complex or immense. To answer the questions, "what are the groups of activities which convery together?", we have used another multivariate statistical technique, Common Factor Analysis. The technique is used to identify those groups of activities which are done together by households or are likely to be done together by households.

For the urban areas of Madison and St. Clair Counties about 51 percent of household behavior fits into seven common patterns or groups of activities. Slightly less household variation (47.5 percent) is accounted for by the regional pattern (region 4) but eight rather than seven groups of activity patterns better describe the regional pattern. Eight groups account for 52.1 percent of all household recreation behavior in the region.

The first group of activities which have a tendency to be interrelated by

households in the urban areas of Madison and St. Clair Counties comprises Day Hiking, Recreational Bicycling, Horseback Riding, Beach Swimming Other than Lake Michigan, Swimming at Pools and Lodging with and without Kitchen Facilities. The same exact grouping of activities was derived from the Region 4 pattern. We may say, then, that some households concentrate most of their recreation activities among these activities and that these activities seem to be characteristic of localized, day activities. It is possible that households which reported swimming in pools may have done so because they were at facilities which had lodging units. For the urban areas of the two counties, the second group of activities which were correlated for household behavior included Sailing at Lake Michigan, Swimming at Lake Michigan, and Sailing Except Lake Michigan. Again, for Region 4, the same activities were grouped. For the third group, motorboating on Lake Michigan, and swimming on Lake Michigan were interrelated. For residents of region 4, motorboating on Lake Michigan and swimming at Lake Michigan were also related but, so was primitive camping. Thus, the families which motorboated on Lake Michigan from the region and who went swimming at Lake Michigan from the region, also tended to be households which went primitive camping. The fourth group of activities in the HDSA area were identical to the eighth group of activities done by residents of region 4: Motorboating with 10 HP or More and Swimming other than Lake Michigan. Day Hiking, Camping Enroute, Drive In Camping, and Swimming Other than Lake Michigan formed an identical group of activities for both the urban residents of St. Clair and Madison Counties and Region 4. In another group of activities were Off Road Driving and Off Road Motorcycling and to lesser degree Lodging with Kitchen Facilities. The final grouping consists of Canoeing on Rivers and Streams, Canoeing on Lakes and Ponds,

Overnight Hiking, Camping with an Organized Group, Primitive Camping and to a lesser degree Lodging without Kitchen Facilities (for both the bi-county urban areas and the Region 4 pattern).

These groups are the major interrelated patterns of activities and account for more than half of all household behavior with regard to the activities. Because there were nonsignificant statistical differences in the pattern of correlation coefficients for the six town HDSA area and the bi-county area, we may infer that these are also the patterns of the 116 households in the HDSA. For those interested in the data rather than the descriptions (Tables 37 and 38) show the factor loadings for the bi-county area and Region 4 area, respectively. The variables, one to twenty-three, correspond to the names of the twenty-three activities. Also presented is information on the degree to which groups of activities are independent of each other. In either table the highest correlation of groups is R = .34 which means that there is very little overlap between the patterns of common activities (R x R = .34 x .34 = .1156) or about an 11.56 percent chance that a household which participates in any one group of activities will participate in another.

In addition to this information, we have developed a set of patterns which describe the degree to which activities are likely to be done given that another activity has been initially chosen for recreation. These conditional probabilities are derived at the state level primarily because of sample size requirements for reliable estimates. Nevertheless, they are relevant to HDSA planning because the previous analyses have shown that the various study areas (the six town HDSA area, the bi-county urban areas, region 4) were essentially the same with regard to activity interrelationships and the derivation of groups of activities which are likely to be done together.

Table 37
Factor Loadings for the Twenty Three Recreation Activities:
Madison and St. Clair Counties

FACTOR STRUCTURE

| | FACTOR 1 | FACTOR 2 | FACTOR 3 | FACTOR 4 | FACTOR 5 | FACTOR 6 | FACTOR 7 | FACTOR 8 |
|---|---|---|---|---|---|---|---|---|
| VAR01 | 0.15045 | 0.08212 | 0.25350 | -0.28022 | 0.24174 | -0.27522 | 0.24005 | -0.30266 |
| VAR02 | 0.05358 | 0.24852 | 0.05675 | -0.40723 | 0.52943 | -0.20419 | 0.16176 | -0.15283 |
| VAR03 | 0.13680 | 0.93299 | 0.06564 | -0.09010 | 0.10995 | -0.14757 | 0.17476 | -0.00833 |
| VAR04 | 0.03388 | 0.25522 | 0.12880 | -0.10117 | 0.01705 | -0.02205 | 0.11443 | -0.16615 |
| VAR05 | 0.16005 | 0.06376 | 0.15640 | -0.07427 | 0.14083 | -0.10240 | 0.12453 | -0.10372 |
| VAR06 | 0.19909 | 0.05488 | 0.55111 | -0.07987 | 0.17808 | -0.04017 | -0.00925 | -0.10585 |
| VAR07 | 0.27659 | 0.07841 | 0.13707 | -0.08934 | 0.10500 | -0.23436 | 0.23348 | -0.62601 |
| VAR08 | 0.47067 | 0.05180 | 0.08644 | -0.23434 | 0.21136 | -0.44715 | 0.27887 | -0.10342 |
| VAR09 | 0.23624 | 0.14795 | 0.14729 | -0.43765 | 0.11681 | -0.31257 | 0.24482 | -0.00667 |
| VAR10 | 0.28271 | 0.06043 | 0.14499 | -0.45598 | 0.11316 | -0.25439 | 0.16207 | -0.14990 |
| VAR11 | 0.13856 | 0.12701 | 0.01778 | -0.18935 | 0.05918 | -0.41563 | 0.19406 | -0.05273 |
| VAR12 | 0.19925 | 0.11630 | 0.36929 | -0.35456 | 0.03386 | -0.09668 | 0.27852 | -0.23220 |
| VAR13 | 0.29253 | 0.00449 | 0.12304 | -0.19242 | 0.12014 | -0.71016 | 0.17596 | -0.36666 |
| VAR14 | 0.47629 | 0.06613 | 0.19494 | -0.13057 | 0.05722 | -0.12492 | 0.11958 | -0.15964 |
| VAR15 | 0.36436 | 0.14791 | 0.17888 | 0.01543 | 0.25560 | -0.13224 | 0.09977 | -0.18451 |
| VAR16 | 0.15090 | -0.00766 | 0.18580 | 0.00788 | 0.42118 | -0.02573 | 0.07658 | -0.01436 |
| VAR17 | 0.19751 | 0.10309 | 0.09593 | 0.03316 | 0.24026 | -0.15935 | 0.56682 | -0.27667 |
| VAR18 | 0.05834 | 0.09862 | 0.00643 | -0.17655 | 0.00144 | -0.13177 | 0.42250 | -0.05967 |
| VAR19 | 0.12751 | 0.56329 | 0.58760 | -0.08372 | 0.21267 | -0.08922 | 0.16215 | 0.00362 |
| VAR20 | 0.40424 | 0.02253 | 0.07324 | -0.17566 | 0.06483 | -0.49699 | 0.31180 | -0.56103 |
| VAR21 | 0.47439 | 0.02715 | 0.16722 | -0.17127 | 0.13723 | -0.29555 | 0.24870 | -0.17650 |
| VAR22 | 0.41453 | 0.05903 | 0.17354 | -0.17300 | 0.18974 | -0.15729 | 0.18799 | -0.23067 |
| VAR23 | 0.30814 | 0.04638 | 0.05581 | -0.11969 | 0.09905 | -0.23434 | 0.06638 | -0.09401 |

Table 38
Factor Loadings for the Twenty Three Recreation Activities:
Governor's Region 4

FACTOR STRUCTURE

PARTICIPATION RECREATION INTERRELATIONSHIPS

| | FACTOR 1 | FACTOR 2 | FACTOR 3 | FACTOR 4 | FACTOR 5 | FACTOR 6 | FACTOR 7 |
|---|---|---|---|---|---|---|---|
| VAR01 | C.17707 | C.14200 | C.26350 | 0.16866 | -C.25601 | C.29258 | -C.36762 |
| VAR02 | C.11895 | C.19057 | C.15545 | -0.04642 | -C.27783 | C.30530 | -C.41790 |
| VAR03 | C.12525 | C.96719 | 0.00633 | -0.04713 | -C.06863 | C.21856 | -C.04420 |
| VAR04 | C.07662 | C.33491 | 0.07669 | 0.05341 | -C.06630 | C.09236 | -C.17078 |
| VAR05 | C.13759 | 0.09557 | C.16781 | C.10335 | -C.13174 | C.24960 | -0.14080 |
| VAR06 | C.17206 | 0.13271 | C.59211 | 0.10161 | -C.05034 | -C.01356 | -C.18049 |
| VAR07 | C.31561 | C.09443 | C.12475 | C.52550 | -0.27550 | C.28047 | -C.28538 |
| VAR08 | 0.54764 | 0.06445 | C.17625 | -C.06650 | -C.49281 | C.36046 | -C.27293 |
| VAR09 | C.27713 | C.12571 | 0.15271 | -0.19133 | -C.25614 | C.29857 | -C.42658 |
| VAR10 | 0.38672 | C.11073 | C.06952 | -C.07834 | -C.29687 | C.13011 | -0.55178 |
| VAR11 | C.15872 | 0.09412 | 0.02968 | -0.12655 | -C.45923 | C.18040 | -C.14434 |
| VAR12 | 0.22277 | C.19055 | C.28213 | -C.08585 | -C.15419 | C.23623 | -C.42721 |
| VAR13 | C.30379 | C.03835 | C.10805 | C.22816 | -C.72282 | C.20258 | -C.24442 |
| VAR14 | 0.51143 | 0.13554 | C.20284 | 0.14905 | -C.12660 | C.10711 | -C.16697 |
| VAR15 | C.55193 | 0.16961 | C.25425 | 0.22910 | -0.11907 | C.16143 | -0.04361 |
| VAR16 | 0.15331 | 0.02379 | 0.29140 | 0.00171 | -C.05750 | C.13118 | -0.04614 |
| VAR17 | C.21292 | C.14389 | C.15149 | 0.17306 | -C.23291 | C.51590 | -0.01932 |
| VAR18 | 0.08598 | 0.12423 | -C.01598 | -0.04177 | -C.13813 | C.38837 | -0.19448 |
| VAR19 | 0.12278 | C.68744 | C.55220 | -0.04868 | -C.11595 | C.17768 | -C.15791 |
| VAR20 | C.40590 | 0.07193 | C.01556 | 0.40566 | -0.50246 | C.40137 | -C.28020 |
| VAR21 | C.48359 | C.06280 | C.19619 | C.07782 | -C.26778 | C.27734 | -C.20247 |
| VAR22 | C.36113 | C.10240 | C.21221 | 0.11021 | -C.11865 | C.37500 | -C.22812 |
| VAR23 | C.31541 | C.04859 | C.07758 | 0.02760 | -0.23570 | C.11078 | -C.14385 |

## POTENTIAL MULTIPLE PURPOSE RECREATION: GROUPS OF SIMILAR ACTIVITIES (B)

In this section of the report, we discuss some of the basic ways in which the twenty-three outdoor recreation activities of this study are interrelated. We do this through an analysis of conditional probabilities. These conditional probabilities represent the likelihood of a household participating in each of the outdoor activities given that an activity has been chosen for participation. We could paraphrase this idea as a question like "What is the likelihood that a household in Illinois will participate in Day Hiking given that they have already chosen to participate in Canoeing on Rivers and Streams?" or "What is the likelihood that a household in Illinois will participate in Recreational Bicyling given that the household has already chosen to participate in Motorboating with more than 10 horsepower?" These activity interrelationships represent useful planning information because planners may need to know which activities are done together on multiple purpose recreation trips, i.e., the degree to which any two activities are likely to occur at recreation facilities. From this information, planners may be able to decide how to best alter the mix of supply features which are present at recreation facilities such that household preferences are more easily meshed with the supply features of recreational facilities when multi-purpose recreation trips are undertaken.

To this end, we now present several sets of information which may be of value in evaluating the mix of facilities which exist at recreation areas. The first set, Tables 39 and 40, represent the conditional probability patterns

TABLE 39

| 1976 | Canoe-Riv. & Str. | Canoe-Lakes/Ponds | Sailing on L.M. | Sailing Except L.M. | Motorboat 10 H.P. or Less | Motorboat on L.M. |
|---|---|---|---|---|---|---|
| Canoe-Riv. & Str. | 1.000 | 0.302 | 0.056 | 0.123 | 0.183 | 0.061 |
| Canoe-Lakes/Ponds | 0.417 | 1.000 | 0.072 | 0.192 | 0.202 | 0.061 |
| Sailing on L.M. | 0.224 | 0.206 | 1.000 | 0.291 | 0.139 | 0.206 |
| Sailing Except L.M. | 0.235 | 0.264 | 0.139 | 1.000 | 0.177 | 0.070 |
| Motorboat 10 H.P. or Less | 0.135 | 0.108 | 0.026 | 0.069 | 1.000 | 0.028 |
| Motorboat on L.M. | 0.175 | 0.127 | 0.149 | 0.105 | 0.110 | 1.000 |
| Motorboat 10 H.P. or More | 0.145 | 0.091 | 0.026 | 0.086 | 0.099 | 0.050 |
| Day Hiking | 0.219 | 0.100 | 0.027 | 0.064 | 0.123 | 0.034 |
| Overnight Hiking | 0.252 | 0.196 | 0.058 | 0.117 | 0.147 | 0.051 |
| Camping with Org. Grp. | 0.194 | 0.167 | 0.032 | 0.088 | 0.148 | 0.051 |
| Camping Enroute | 0.177 | 0.123 | 0.032 | 0.065 | 0.161 | 0.044 |
| Primitive Camping | 0.286 | 0.216 | 0.045 | 0.112 | 0.189 | 0.059 |
| Drive In Camping | 0.141 | 0.094 | 0.023 | 0.055 | 0.145 | 0.036 |
| Rec. Bicycling | 0.114 | 0.090 | 0.052 | 0.072 | 0.107 | 0.055 |
| Horseback Riding | 0.135 | 0.101 | 0.045 | 0.070 | 0.129 | 0.064 |
| Snowmobiling | 0.152 | 0.141 | 0.029 | 0.092 | 0.115 | 0.079 |
| Off Road Motorcycling | 0.155 | 0.099 | 0.033 | 0.060 | 0.146 | 0.036 |
| Off Road Driving | 0.170 | 0.117 | 0.038 | 0.102 | 0.211 | 0.060 |
| Swimming at L.M. | 0.134 | 0.109 | 0.116 | 0.101 | 0.094 | 0.125 |
| Swimming Except L.M. | 0.122 | 0.099 | 0.025 | 0.077 | 0.145 | 0.036 |
| Swimming in Pools | 0.100 | 0.173 | 0.028 | 0.060 | 0.117 | 0.038 |
| Lodging with Kitch Fac. | 0.123 | 0.089 | 0.030 | 0.076 | 0.186 | 0.044 |
| Lodging w/out Kitch. Fac. | 0.108 | 0.066 | 0.030 | 0.055 | 0.122 | 0.041 |

| Motorboat 10 H. P. or More | Day Hiking | Overnight Hiking | Camping with Org. Group | Camping Enroute | Primitive Camping | Drive in Camping | Rec. Bicycling | Horseback Riding |
|---|---|---|---|---|---|---|---|---|
| 0.441 | 0.563 | 0.180 | 0.201 | 0.171 | 0.230 | 0.567 | 0.259 | 0.216 |
| 0.379 | 0.609 | 0.194 | 0.240 | 0.164 | 0.240 | 0.522 | 0.284 | 0.225 |
| 0.309 | 0.473 | 0.164 | 0.133 | 0.121 | 0.145 | 0.370 | 0.473 | 0.285 |
| 0.496 | 0.530 | 0.159 | 0.174 | 0.119 | 0.171 | 0.417 | 0.313 | 0.214 |
| 0.221 | 0.396 | 0.078 | 0.114 | 0.115 | 0.113 | 0.431 | 0.181 | 0.153 |
| 0.434 | 0.425 | 0.105 | 0.154 | 0.123 | 0.136 | 0.421 | 0.360 | 0.298 |
| 1.000 | 0.379 | 0.069 | 0.095 | 0.107 | 0.110 | 0.442 | 0.191 | 0.156 |
| 0.264 | 1.000 | 0.124 | 0.152 | 0.126 | 0.111 | 0.455 | 0.267 | 0.185 |
| 0.292 | 0.755 | 1.000 | 0.326 | 0.237 | 0.326 | 0.652 | 0.367 | 0.305 |
| 0.277 | 0.635 | 0.224 | 1.000 | 0.169 | 0.177 | 0.589 | 0.302 | 0.240 |
| 0.335 | 0.568 | 0.176 | 0.182 | 1.000 | 0.176 | 0.722 | 0.259 | 0.195 |
| 0.413 | 0.598 | 0.290 | 0.229 | 0.210 | 1.000 | 0.521 | 0.263 | 0.210 |
| 0.333 | 0.491 | 0.116 | 0.152 | 0.173 | 0.104 | 1.000 | 0.217 | 0.176 |
| 9.254 | 0.508 | 0.115 | 0.138 | 0.110 | 0.093 | 0.382 | 1.000 | 0.250 |
| 0.294 | 0.500 | 0.136 | 0.155 | 0.117 | 0.105 | 0.441 | 0.355 | 1.000 |
| 0.453 | 0.432 | 0.123 | 0.107 | 0.131 | 0.113 | 0.395 | 0.280 | 0.225 |
| 0.396 | 0.474 | 0.117 | 0.106 | 0.141 | 0.119 | 0.465 | 0.239 | 0.221 |
| 0.483 | 0.513 | 0.181 | 0.132 | 0.185 | 0.170 | 0.457 | 0.234 | 0.238 |
| 0.228 | 0.473 | 0.111 | 0.134 | 0.092 | 0.085 | 0.375 | 0.442 | 0.255 |
| 0.387 | 0.466 | 0.088 | 0.110 | 0.114 | 0.098 | 0.449 | 0.230 | 0.181 |
| 0.278 | 0.425 | 0.080 | 0.134 | 0.098 | 0.079 | 0.385 | 0.251 | 0.185 |
| 0.377 | 0.439 | 0.082 | 0.128 | 0.105 | 0.086 | 0.369 | 0.247 | 0.184 |
| 0.295 | 0.453 | 0.092 | 0.112 | 0.118 | 0.081 | 0.355 | 0.255 | 0.184 |

TABLE 39, part 2

| Snowmobiling | Off Road Motorcycling | Off Road Driving | Swimming at L.M. | Swimming Except at L.M. | Swimming in Pools | Lodging with Kitchen Facilities | Lodging w/out Kitchen Facilities |
|---|---|---|---|---|---|---|---|
| 0.088 | 0.201 | 0.069 | 0.157 | 0.579 | 0.559 | 0.220 | 0.191 |
| 0.114 | 0.177 | 0.065 | 0.177 | 0.648 | 0.564 | 0.219 | 0.162 |
| 0.067 | 0.170 | 0.061 | 0.539 | 0.467 | 0.624 | 0.212 | 0.212 |
| 0.101 | 0.148 | 0.078 | 0.226 | 0.693 | 0.632 | 0.258 | 0.186 |
| 0.050 | 0.140 | 0.063 | 0.081 | 0.510 | 0.483 | 0.246 | 0.159 |
| 0.132 | 0.136 | 0.070 | 0.421 | 0.491 | 0.601 | 0.228 | 0.211 |
| 0.087 | 0.170 | 0.064 | 0.088 | 0.607 | 0.511 | 0.222 | 0.172 |
| 0.158 | 0.142 | 0.048 | 0.128 | 0.510 | 0.544 | 0.180 | 0.184 |
| 0.100 | 0.213 | 0.102 | 0.181 | 0.588 | 0.625 | 0.205 | 0.228 |
| 0.060 | 0.132 | 0.051 | 0.151 | 0.504 | 0.716 | 0.220 | 0.191 |
| 0.079 | 0.190 | 0.078 | 0.112 | 0.565 | 0.565 | 0.195 | 0.217 |
| 0.081 | 0.191 | 0.085 | 0.123 | 0.581 | 0.544 | 0.191 | 0.178 |
| 0.057 | 0.150 | 0.046 | 0.109 | 0.530 | 0.533 | 0.164 | 0.156 |
| 0.071 | 0.136 | 0.041 | 0.227 | 0.479 | 0.613 | 0.193 | 0.197 |
| 0.082 | 0.178 | 0.060 | 0.286 | 0.534 | 0.639 | 0.205 | 0.202 |
| 1.000 | 0.291 | 0.102 | 0.160 | 0.550 | 0.529 | 0.217 | 0.188 |
| 0.130 | 1.000 | 0.127 | 0.107 | 0.560 | 0.606 | 0.195 | 0.171 |
| 0.047 | 0.408 | 1.000 | 0.091 | 0.566 | 0.528 | 0.204 | 0.196 |
| 0.079 | 0.118 | 0.031 | 1.000 | 0.479 | 0.622 | 0.196 | 0.187 |
| 0.067 | 0.153 | 0.048 | 0.118 | 1.000 | 0.567 | 0.208 | 0.172 |
| 0.055 | 0.141 | 0.038 | 0.131 | 0.484 | 1.000 | 0.172 | 0.171 |
| 0.071 | 0.142 | 0.046 | 0.129 | 0.553 | 0.535 | 1.000 | 0.186 |
| 0.062 | 0.126 | 0.045 | 0.124 | 0.465 | 0.538 | 0.188 | 1.000 |

TABLE 39, part 3

TABLE 40

1971

| | Canoe-Riv & Str. | Canoe-Lake/Pond | Sailing on L.M. | Sailing Except on L.M. | Motorboat 10 H.P. or Less | Motorboat on L.M. |
|---|---|---|---|---|---|---|
| Canoe - Riv. & Str. | 1.000 | 0.389 | 0.072 | 0.120 | 0.204 | 0.068 |
| Canoe - Lakes/Ponds | 0.540 | 1.000 | 0.066 | 0.202 | 0.210 | 0.061 |
| Sailing on L.M. | 0.339 | 0.226 | 1.000 | 0.304 | 0.087 | 0.200 |
| Sailing Except on L.M. | 0.238 | 0.288 | 0.129 | 1.000 | 0.172 | 0.092 |
| Motorboat 10 H.P. or Less | 0.124 | 0.092 | 0.011 | 0.052 | 1.000 | 0.035 |
| Motorboat on L.M. | 0.175 | 0.114 | 0.109 | 0.118 | 0.147 | 1.000 |
| Motorboat 10 H.P. or More | 0.127 | 0.090 | 0.021 | 0.080 | 0.110 | 0.049 |
| Day Hiking | 0.133 | 0.104 | 0.022 | 0.064 | 0.145 | 0.034 |
| Overnight Hiking | 0.255 | 0.175 | 0.042 | 0.098 | 0.182 | 0.053 |
| Camping with Org. Group | 0.215 | 0.163 | 0.030 | 0.077 | 0.148 | 0.055 |
| Camping Enroute | 0.181 | 0.118 | 0.020 | 0.070 | 0.183 | 0.058 |
| Primitive Camping | 0.259 | 0.173 | 0.048 | 0.090 | 0.181 | 0.053 |
| Drive in Camping | 0.136 | 0.194 | 0.017 | 0.052 | 0.175 | 0.039 |
| Rec. Bicycling | 0.110 | 0.085 | 0.033 | 0.064 | 0.106 | 0.050 |
| Horseback Riding | 0.133 | 0.099 | 0.032 | 0.075 | 0.147 | 0.059 |
| Snowmobiling | 0.160 | 0.133 | 0.034 | 0.096 | 0.148 | 0.105 |
| Off-Road Motorcycling | 0.141 | 0.090 | 0.019 | 0.060 | 0.169 | 0.052 |
| Off-Road Driving | 0.163 | 0.117 | 0.056 | 0.092 | 0.189 | 0.087 |
| Swimming at L.M. | 0.126 | 0.092 | 0.079 | 0.069 | 0.108 | 0.127 |
| Swimming Except L.M. | 0.112 | 0.186 | 0.023 | 0.065 | 0.159 | 0.039 |
| Swimming in Pools | 0.103 | 0.070 | 0.020 | 0.052 | 0.129 | 0.038 |
| Lodging with Kitch. Fac. | 0.129 | 0.091 | 0.021 | 0.067 | 0.217 | 0.047 |
| Lodging w/out Kitch. Fac. | 0.113 | 0.077 | 0.021 | 0.070 | 0.147 | 0.041 |

| Motorboat 10 H.P. or More | Day Hiking | Overnight Hiking | Camping in Org. Group | Camping Enroute | Primitive Camping | Drive In Camping | Rec. Bicycling | Horseback Riding |
|---|---|---|---|---|---|---|---|---|
| 0.414 | 0.615 | 0.212 | 0.238 | 0.201 | 0.250 | 0.543 | 0.287 | 0.315 |
| 0.409 | 0.668 | 0.202 | 0.251 | 0.182 | 0.233 | 0.524 | 0.309 | 0.325 |
| 0.330 | 0.470 | 0.165 | 0.157 | 0.104 | 0.217 | 0.330 | 0.409 | 0.357 |
| 0.516 | 0.586 | 0.161 | 0.168 | 0.154 | 0.172 | 0.418 | 0.333 | 0.352 |
| 0.217 | 0.404 | 0.092 | 0.099 | 0.123 | 0.106 | 0.424 | 0.169 | 0.211 |
| 0.408 | 0.398 | 0.114 | 0.156 | 0.166 | 0.133 | 0.398 | 0.336 | 0.355 |
| 1.000 | 0.404 | 0.083 | 0.102 | 0.127 | 0.112 | 0.430 | 0.210 | 0.242 |
| 0.286 | 1.000 | 0.133 | 0.152 | 0.132 | 0.127 | 0.425 | 0.283 | 0.258 |
| 0.326 | 0.736 | 1.000 | 0.319 | 0.268 | 0.335 | 0.570 | 0.344 | 0.341 |
| 0.300 | 0.633 | 0.240 | 1.000 | 0.250 | 0.222 | 0.603 | 0.333 | 0.308 |
| 0.374 | 0.551 | 0.201 | 0.250 | 1.000 | 0.201 | 0.722 | 0.215 | 0.265 |
| 0.379 | 0.606 | 0.288 | 0.253 | 0.230 | 1.000 | 0.491 | 0.305 | 0.290 |
| 0.350 | 0.490 | 0.118 | 0.167 | 0.200 | 0.119 | 1.000 | 0.231 | 0.242 |
| 0.262 | 0.499 | 0.109 | 0.141 | 0.091 | 0.113 | 0.354 | 1.000 | 0.343 |
| 0.335 | 0.505 | 0.120 | 0.144 | 0.124 | 0.119 | 0.410 | 0.380 | 1.000 |
| 0.497 | 0.414 | 0.109 | 0.117 | 0.173 | 0.148 | 0.451 | 0.290 | 0.330 |
| 0.425 | 0.439 | 0.139 | 0.133 | 0.145 | 0.152 | 0.482 | 0.265 | 0.348 |
| 0.444 | 0.500 | 0.194 | 0.153 | 0.224 | 0.209 | 0.500 | 0.301 | 0.367 |
| 0.234 | 0.443 | 0.100 | 0.127 | 0.117 | 0.103 | 0.347 | 0.448 | 0.344 |
| 0.357 | 0.454 | 0.096 | 0.118 | 0.121 | 0.112 | 0.418 | 0. 253 | 0.249 |
| 0.277 | 0.411 | 0.090 | 0.124 | 0.112 | 0.091 | 0.369 | 0.267 | 0.247 |
| 0.373 | 0.430 | 0.109 | 0.139 | 0.124 | 0.103 | 0.376 | 0.252 | 0.256 |
| 0.345 | 0.471 | 0.107 | 0.115 | 0.129 | 0.119 | 0.371 | 0.258 | 0.259 |

TABLE 40, part 2

| Snowmobiling | Off Road Motorcycling | Off Road Driving | Swimming in L.M | Swimming Except in L.M. | Swimming in Pools | Lodging with Kitchen Facilities | Lodging w/out Kitchen Facilities |
|---|---|---|---|---|---|---|---|
| 0.096 | 0.190 | 0.059 | 0.186 | 0.650 | 0.652 | 0.291 | 0.219 |
| 0.110 | 0.169 | 0.059 | 0.189 | 0.693 | 0.611 | 0.284 | 0.207 |
| 0.096 | 0.122 | 0.096 | 0.548 | 0.617 | 0.609 | 0.226 | 0.199 |
| 0.114 | 0.161 | 0.066 | 0.201 | 0.755 | 0.656 | 0.300 | 0.271 |
| 0.054 | 0.138 | 0.041 | 0.097 | 0.557 | 0.489 | 0.297 | 0.173 |
| 0.161 | 0.180 | 0.081 | 0.483 | 0.588 | 0.611 | 0.275 | 0.204 |
| 0.091 | 0.176 | 0.049 | 0.106 | 0.634 | 0.537 | 0.258 | 0.206 |
| 0.054 | 0.128 | 0.039 | 0.142 | 0.571 | 0.563 | 0.210 | 0.198 |
| 0.078 | 0.226 | 0.084 | 0.177 | 0.667 | 0.685 | 0.295 | 0.251 |
| 0.063 | 0.162 | 0.050 | 0.170 | 0.622 | 0.712 | 0.283 | 0.202 |
| 0.093 | 0.176 | 0.073 | 0.156 | 0.636 | 0.637 | 0.253 | 0.226 |
| 0.091 | 0.211 | 0.078 | 0.158 | 0.670 | 0.596 | 0.240 | 0.240 |
| 0.067 | 0.162 | 0.045 | 0.128 | 0.605 | 0.582 | 0.212 | 0.180 |
| 0.066 | 0.137 | 0.042 | 0.253 | 0.560 | 0.644 | 0.217 | 0.192 |
| 0.083 | 0.199 | 0.056 | 0.215 | 0.612 | 0.662 | 0.244 | 0.214 |
| 1.000 | 0.293 | 0.083 | 0.198 | 0.667 | 0.574 | 0.293 | 0.216 |
| 0.130 | 1.000 | 0.107 | 0.134 | 0.634 | 0.642 | 0.239 | 0.214 |
| 0.138 | 0.398 | 1.000 | 0.173 | 0.638 | 0.566 | 0.265 | 0.235 |
| 0.080 | 0.122 | 0.042 | 1.000 | 0.572 | 0.652 | 0.231 | 0.195 |
| 0.069 | 0.147 | 0.040 | 0.146 | 1.000 | 0.595 | 0.241 | 0.185 |
| 0.054 | 0.137 | 0.032 | 0.152 | 0.546 | 1.000 | 0.207 | 0.182 |
| 0.078 | 0.143 | 0.042 | 0.151 | 0.620 | 0.582 | 1.000 | 0.211 |
| 0.066 | 0.149 | 0.044 | 0.148 | 0.551 | 0.590 | 0.244 | 1.000 |

TABLE 40, part 3

for households in Illinois for 1971 and 1976. The activity listed in the rows of the tables represents the one initially chosen for outdoor recreation and the probabilities listed under the column headings represent the probability of the column activity being undertaken given that the row activity had been initially chosen. For example, in 1971, the probability of going day hiking given that a household had chosen to participate in primitive camping was 0.606. Or, 60.6 percent of the households which participated in primitive camping during 1971 had also participated in day hiking. For 1976, 0.598 was the probability of participating in day hiking given that households participated in primitive camping. All probability values of approximately 0.400 (or a forty percent chance of participation) are underlined in the 1971 and 1976 probability tables.

Please note that these tables are not symmetric, e.g., that the probability of primitive camping given participation in canoeing on rivers and streams (0.250 for 1971; 0.230 for 1976) need not equal the probability of participation in canoeing on rivers and streams given participation in primitive camping (0.259 in 1971; 0.286 in 1976). A hypothetical example may help to illustrate why such differences can occur. Suppose that 1,000 households participated in canoeing on rivers and streams and four hundred participated in primitive camping during 1976. Further, suppose that 230 households of the 1,000 who went canoeing on rivers and streams during 1976 also participated in primitive camping; the resulting conditional probability would be 0.230 for primitive camping and the maximum possible primitive camping conditional probability could have been 400/1000 or 0.400. For the conditional probability of canoeing on rivers and streams, the maximum probability could have been 1,000 or 400/400. Since more than 400 households went

canoeing on rivers and streams and only 400 participated in primitive camping, we might have found that all households who went canoeing on rivers and streams also participated in primitive camping. But, let us suppose that of the 400 households who took part in primitive camping, only 114 also went canoeing on rivers or streams. Even though one thousand households took part in canoeing on rivers and streams, only 114 of these had also taken part in primitive camping, thus the resulting conditional probability of 0.285.

Additionally, from these tables it is possible to get an idea of which activities are the most likely for households to participate in given that one of the row activities is the initial activity for which a recreation trip is initiated. By counting the number of times an activity has a probability of 0.400 or greater (or any other arbitrarily chosen value) we derive an indication of the popularity or likelihood of this activity generating participation given that any other activity is initially undertaken. The seven column activities with conditional probabilities of greater than 0.400 are ranked as follows:

| Activity | Rank in 1971 | Rank in 1976 |
|---|---|---|
| Swimming at Beaches Except L.M. | 1 | 2 |
| Swimming at Pools | 2 | 1 |
| Day Hiking | 3 | 3 |
| Camping You Can Drive In To | 4 | 4 |
| Motorboating: 10 H.P. or More | 5 | 5 |
| Recreational Bicycling | 6 | 7 |
| Swimming at L.M. | 7 | 6 |

As one can see, there are only minor changes in the pattern of the most popular "second choice" recreational activities between 1971 and 1976. Table 41

TABLE 41

Average Conditional Probabilities

| Activity | 1971 | Rank | 1976 | Rank |
|---|---|---|---|---|
| Canoe - Riv/Str. | .182 | 11 | .174 | 11 |
| Canoe - Lakes/Ponds | .135 | 18 | .135 | 18 |
| Sailing on L.M. | .042 | 23 | .051 | 23 |
| Sailing Except on L.M. | .093 | 19 | .097 | 19 |
| Motorboat 10 H.P.> | .157 | 16 | .145 | 14 |
| Motorboat on L.M. | .066 | 21 | .060 | 22 |
| Motorboat 10 H.P.< | .357 | 5 | .347 | 5 |
| Day Hiking | .506 | 3 | .504 | 3 |
| Overnight Hiking/Camping | .145 | 17 | .134 | 17 |
| Camping in Org. Group | .165 | 13 | .155 | 13 |
| Camping Enroute | .159 | 14/15 | .138 | 16 |
| Primitive Camping | .159 | 14/15 | .139 | 15 |
| Drive In Camping | .452 | 4 | .463 | 4 |
| Recreational Bicycling | .294 | 7 | .284 | 6 |
| Horseback Riding | .300 | 6 | .217 | 7 |
| Snowmobiling | .088 | 20 | .084 | 20 |
| Off Road Motorcycling | .178 | 12 | .175 | 10 |
| Off Road Driving | .059 | 22 | .064 | 21 |
| Swimming at L.M. | .196 | 10 | .171 | 12 |
| Swimming Except L.M. | .621 | 1 | .543 | 2 |
| Swimming in Pools | .611 | 2 | .576 | 1 |
| Lodging with Kitch Fac. | .255 | 8 | .206 | 8 |
| Lodging w/out Kitch. Fac. | .210 | 9 | .187 | 9 |

further illustrates this point. This table portrays the average conditional probability of an activity being participated in given that another activity has already been chosen for the household's initial participation. The rank order of the probabilities is also presented. Those with low rank values are the activities which are likely to be most frequent as "second choice" activities given a household's decision to participate in more than one activity for a recreational trip. Clearly, Swimming activities (in pools, or at beaches except at Lake Michigan) and Day Hiking and Camping That You Can Drive In To are the only major activities worthy of special consideration because of their very high conditional probabilities in 1976. It is also worth noting that most of the activities experienced a decline in the conditional probabilities, thereby indicating that households became slightly more oriented towards single purpose recreation behavior or when viewed in another way, more likely to concentrate their outdoor recreation participation in fewer categories of activities than in prior years. Conversely, those activities with high ranks and low conditional probabilities may be considered as either activities which are single purpose trip activities or activities which are principal/first choice activities.

Beyond this analysis, an attempt was made to group recreational activities so that activities which were viewed by households as essentially similar as "potential" second choice activities could be defined. The purpose of such an analysis was to define those activities which were identified by households as equally reasonable second activities for participation given an initial activity. For the probability patterns of 1971 and 1976, a 23 by 23 matrix of intercorrelations was formed and then reduced to basic patterns of variation using a well known multivariate statistical procedure, common

factor analysis. The activities which were included in the basic groups derived here were almost always the same for 1971 and 1976. For the statistically minded, iterative procedures for both orthogonal and oblique rotations were utilized but only for the purpose of examining possible changes in group structure and membership. Let us simply say that the following groups of activities were very stable (in terms of their associations) for the five-year period, 1971-1976. Basically, eight clusters or groups of activities were identified as "second choice" activities.

The first group of activities consisted of Sailing on Lake Michigan, Swimming at Lake Michigan and Motorboating on Lake Michigan. To a lesser degree, recreational bicycling belonged to the group. The second group of similarly perceived activities consisted of Day Hiking, Overnight Camping, Camping in an Organized Group, and Primitive Camping. The third group consisted of Canoeing on Rivers and Streams, Canoeing on Lakes and Ponds, and to a somewhat lesser degree, sailing except on Lake Michigan. The fourth group of activities included Camping Enroute and Drive In Camping; the fifth group included Motorboating with 10 H.P. or More or Motorboating with 10 H.P. or Less. Lodging Without Kitchens was by itself as was Swimming in Pools. Off-Road Driving and Off-Road Motorcycling were in a separate group. Recreation activities not identified in these specific groups were not viewed as being similar to the other members of any single one of these groups. In any case, these eight major groups identify activities which are "potential" substitutes, one for another, and account for almost two-thirds of the variation in household multiple-purpose recreation patterns. That is to say, given that an initial activity has been chosen for participation, households would be willing to substitute Swimming at Lake Michigan for Sailing on Lake Michigan

(group 1). This does not mean that each activity will have the same average conditional probability as another "second choice" activity but rather than when an initial activity is to be chosen, most people evaluate Swimming at Lake Michigan as a second choice activity in the same general manner as they evaluate Sailing on Lake Michigan as a potential second activity.

Generally, one can conclude that households tend to equate similar types of activities and that there is a strong degree of potential substitutability. Recreation policies which aim at either encouraging or discouraging multiple purpose recreation trips should consider this type of information; the substitutability of activities vis-a-vis the current patterns of supply relevant to the variety of activities which can presently be undertaken at recreation facilities.

# CONCLUSIONS AND RECOMMENDATIONS

First and foremost, there are no major demographic differences between the study areas which cause significant differences in the number of activity days of participation for those individuals taking part in the twenty-three outdoor recreation activities of this study. Race did not appear to be a significant factor in the intensity of participation once a household engaged in an outdoor recreation activity.

Second, activity days of recreation per participant for the six town HDSA area (intensity of participation) approached and sometimes exceeded other areas' participation notwithstanding small sample sizes. Household participation rates for residents of the HDSA residents, generally, were lower than either the suburban areas or the adjacent governor's planning regions. One must conclude, therefore, HDSA residents have a normal intensity of participation for outdoor recreation activities but a narrower band of activities within which participation is concentrated.

Third, contrary to popular opinion, urban residents are not at a significant disadvantage with regard to the location of recreation areas. One can see that for the Harding Ditch study area (in comparison to the bi-county urban areas), participants did not travel further distances to either in-state or out-of-state destinations. The same can be said for the associated travel times for recreation participants. However, an inspection of the pattern of travel does show that whereas the average distance travelled was not less for the HDSA residents, they visited fewer regions of Illinois as recreation

destinations.

Fourth, participation in several activities is heavily oriented towards out-of-state destinations (Canoeing, Sailing, Camping with Organized Groups, Transient Camping, and Lodging with or without kitchen facilities).

Fifth, participation in other activities is highly localized in the study area (Recreational Bicycling, Off-Road Motorcycling, Off-Road Driving, Swimming at Pools).

Sixth, participation in other activities is localized in areas adjacent to the study area but not out-of-state (Motorboating with 10 HP or Less, Day Hiking, Overnight Hiking, Drive-in Camping, Horseback Riding, Beach Swimming, Off-Road Motorcycling, Off-Road Driving).

Seventh, in terms of the sheer volume of actual outdoor recreation done by HDSA residents, Swimming at Pools, Recreational Bicycling, Beach Swimming Not at Lake Michigan, Drive in Camping, Day Hiking, Motorboating with 10 HP or More, Off-Road Motorcycling and Off-Road Driving are the most participated in activities. This is not to say that sizable participation didn't take place for other activities.

Eight, there are few differences between the groups of activities which households tend to a) either do together (pp. 83-95), or b) substitute one for another (pp. 96-108). At the state level (not presented), there is minor but insignificant variation, thereby confirming the general groupings of activity participation by households.

Ninth, future increases in participation are expected to follow population growth patterns as predicted by the Illinois' Bureau of the Budget with a ten to fifteen percent increase in participation from 1975 through 1995. Although sizable volumes of participation do exist for East St. Louis residents, no

explanation has been found for the lower than average household participation rates, and the lower than average growth in participation. We do caution, however, that these interpretations may be lower than actual total participation patterns because participation was only tabulated for public facilities (excluding private clubs or unregulated private lands).

Suggestions

1) Consider the feasibility of jointly developing recreation areas with other local, state or federal agencies as a means of spreading the costs of recreation development and making the Harding Ditch Area a flexible one for alternative but not competitive uses.

2) We recommend development of land for recreation activities which are intensive in use and popular. This is because the amount of land available for development is limited and low frequency or low density use of the potential recreation area (The Harding Ditch Area) would not significantly affect total recreation participation. Furthermore, the activities which have been identified as the most popular by the HDSA residents are also those which require the least equipment and investment. They are, therefore, the activities which present the least imposing barrier to "learning by doing" (and, thus, an increase in participation).

3) It is also suggested that activities or groups of activities be evaluated as to their compatibility. Some are simply incompatible (such as primitive camping and recreational bicycling).

Lastly, one final issue is discussed here: household demand vs household participation (use). When one measures or projects participation, projections

reflect current conditions: demographic, economic, social, travel and accessibility patterns, the supply (quantity and quality) of recreation available, and the interrelationships among these things. Tenuous assumptions about the relationships restrict the value of recreation forecasts. Unforeseen changes in supply also affect recreation patterns. Nevertheless, when household participation (use) is used as the measure of household demand, actual behavior is being monitored. This is always the safest procedure for measuring minimal total demand. But, it cannot give an accurate picture for things not considered as use. For example, in measuring the value of "wilderness" many people would prefer wilderness areas to be preserved and they are willing to pay (through taxes) for their "demand" or "psychic satisfaction" although they may never visit a wilderness area and be tabulated as a "user" of wilderness. Measuring such social benefits must enter the calculus of recreation planning. There are marketing and geographical methods being developed to measure these subjective utilities but a great deal of study is yet to be done to integrate them into the recreation planning process. In the final analysis, then, our recommendations and analysis project expected behavior or use and are "safe" or conservative.

## FOOTNOTES

(1) Assessing Demand for Outdoor Recreation by National Academic of Sciences/ National Research Council for the Bureau of Outdoor Recreation of the U.S. Department of Interior, 1975, Washington, D.C.; see Chapter I, pp. 7-9.

(2) Ibid., pp. 10-19.

(3) R. B. Cooper, et. al., "Recreation Demand Survey and Forecasts", Upper Great Lakes Regional Recreation Planning Study (part II), Institute for Environmental Studies, University of Wisconsin, Madison, Wisconsin, 1974, pp. 58-62; also see C. J. Chichetti, J. J. Seneca and P. Davidson, The Demand and Supply of Outdoor Recreation, Bureau of Economic Research, Rutgers-The State University, New Brunswick, New Jersey, 1969.

(4) These characteristics were determined in consultation with members of the Long Range Planning Division of the Illinois Department of Conservation. Past Survey research was examined by the Long Range Planning Division as well as review of past Statewide Comprehensive Outdoor Recreation Plans.

(5) These statistics were taken from the Illinois volume of 1970 U.S. Census of Population. Tables from the census dealing with urban places of various sized listed the number of people per household for all towns except Maryville which had a 1975 population of 1,290 persons.

(6) Table 4 lists the Confidence Intervals of the two study regions (twice the standard error of proportions). The Student t-formula for pooled variance was used to compute a combined error proportion (9.5 percent) for both regions taken together. Because the larger region had 1.825 times the population of the smaller area the underparticipation and overparticipation ratios were determined by taking $1.825 \pm .095$ (1.825). The value of the ratio for larger than expected participation in the East St. Louis area was 1.65 and for less than expected participation the ratio was 2.01.

(7) Illinois Population Projections: 1970-2025 by the Bureau of the Budget, State of Illinois, Springfield, Illinois, July 1976; see pp. 227-230.

# APPENDIX A

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PHONE NUMBER CALLED

| AREA | PREFIX | LINE |
|---|---|---|
| | | |

CODED TELEPHONE NUMBER

| AREA | PREFIX | LINE |
|---|---|---|
| 0 0 0 | 0 0 0 | 0 0 0 0 |
| 1 1 1 | 1 1 1 | 1 1 1 1 |
| 2 2 2 | 2 2 2 | 2 2 2 2 |
| 3 3 3 | 3 3 3 | 3 3 3 3 |
| 4 4 4 | 4 4 4 | 4 4 4 4 |
| 5 5 5 | 5 5 5 | 5 5 5 5 |
| 6 6 6 | 6 6 6 | 6 6 6 6 |
| 7 7 7 | 7 7 7 | 7 7 7 7 |
| 8 8 8 | 8 8 8 | 8 8 8 8 |
| 9 9 9 | 9 9 9 | 9 9 9 9 |

MONTH Call Was Placed

| | 1st | 2nd | 3rd |
|---|---|---|---|
| October | o | o | o |
| November | n | n | n |
| December | d | d | d |
| January | j | j | j |
| February | f | f | f |
| March | m | m | m |

DAY OF MONTH Call Was Placed

| 1st | 2nd | 3rd |
|---|---|---|
| 0 0 | 0 0 | 0 0 |
| 1 1 | 1 1 | 1 1 |
| 2 2 | 2 2 | 2 2 |
| 3 3 | 3 3 | 3 3 |
| 4 | 4 | 4 |
| 5 | 5 | 5 |
| 6 | 6 | 6 |
| 7 | 7 | 7 |
| 8 | 8 | 8 |
| 9 | 9 | 9 |

TIME OF DAY Call Was Placed

| | 1st | 2nd | 3rd |
|---|---|---|---|
| 8-9 am | 8 | 8 | 8 |
| 9-10 am | 9 | 9 | 9 |
| 10-11 am | 10 | 10 | 10 |
| 11-12 noon | 11 | 11 | 11 |
| 12-1 pm | 12 | 12 | 12 |
| 1-2 pm | 1 | 1 | 1 |
| 2-3 pm | 2 | 2 | 2 |
| 3-4 pm | 3 | 3 | 3 |
| 4-5 pm | 4 | 4 | 4 |
| 5-6 pm | 5 | 5 | 5 |
| 6-7 pm | 6 | 6 | 6 |
| 7-8 pm | 7 | 7 | 7 |
| 8-9 pm | 8 | 8 | 8 |
| 9-10 pm | 9 | 9 | 9 |

(IF PHONE IS ANSWERED...GIVE INTRO... THEN) May I ask, is this a business phone or a private residence?

| | 1st | 2nd | 3rd |
|---|---|---|---|
| Business | b | b | b |
| Residence | r | r | r |

(IF BUSINESS) I'm sorry, but our interviews are being conducted with private residences. Thank you anyway. Goodbye.

(IF RESIDENCE) And am I speaking to the head of the household?

| | 1st | 2nd | 3rd |
|---|---|---|---|
| yes | y | y | y |
| no | n | n | n |

(IF YES...BEGIN INTERVIEW)

(IF NO) What is your relationship to the head of the household?

| | 1st | 2nd | 3rd |
|---|---|---|---|
| Co-head | co | co | co |
| Spouse | s | s | s |
| Unmarried Child | uc | uc | uc |
| Married Child | mc | mc | mc |
| Other relative | or | or | or |
| Friend/Neighbor | f | f | f |
| Employee | e | e | e |
| Other non-rel. | on | on | on |

# OF CALLS MADE

1 2 3

COMMENT:

(IF NEEDED) Do you regularly live at this residence?

| | 1st | 2nd | 3rd |
|---|---|---|---|
| Yes | y | y | y |
| No | n | n | n |

(IF NO) May I speak to someone who lives there?

(IF NEEDED) And are you over 16 years old?

| | 1st | 2nd | 3rd |
|---|---|---|---|
| Yes | y | y | y |
| No | n | n | n |

(IF NO) May I speak to someone who is over 16?

(RECORD SEX OF PERSON ANSWERING THE PHONE)

| | 1st | 2nd | 3rd |
|---|---|---|---|
| Male | m | m | m |
| Female | f | f | f |
| Uncertain | u | u | u |

RESULTS OF CALL

| | 1st | 2nd | 3rd |
|---|---|---|---|
| Non-Existent Number/Disconnected | nn | nn | nn |
| Temporarily Out of Service | t | t | t |
| Pay Telephone Reached | p | p | p |
| Business Telephone Reached | b | b | b |
| Busy Signal | bs | bs | bs |
| Phone Rang But No Answer | na | na | na |
| Inconvenient To Talk Then | i | i | i |
| No Eligible Respondent Home | ne | ne | ne |
| Phone Interview Not Possible | np | np | np |
| Interview Begun Or Completed | c | c | c |
| Refused to Participate | r | r | r |

COUNTY OF RESIDENCE

0 0 0
1 1 1
2 2 2
3 3 3
4 4 4
5 5 5
6 6 6
7 7 7
8 8 8
9 9 9

INTERVIEWER #

| 1st | 2nd | 3rd |
|---|---|---|
| 0 0 | 0 0 | 0 0 |
| 1 1 | 1 1 | 1 1 |
| 2 2 | 2 2 | 2 2 |
| 3 3 | 3 3 | 3 3 |
| 4 4 | 4 4 | 4 4 |
| 5 5 | 5 5 | 5 5 |
| 6 6 | 6 6 | 6 6 |
| 7 7 | 7 7 | 7 7 |
| 8 8 | 8 8 | 8 8 |
| 9 9 | 9 9 | 9 9 |

OPTICAL SCANNING CORPORATION

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PHONE: AREA | PREFIX | LINE

INTERVIEWER | SUP | PHONE | SERIAL

NOTES

I would like to ask some questions about the kinds of outdoor recreation you and your family participate in and how you have changed over the last few years. But first I need some information that will make it easier to ask the questions directly.

What city or town do you live in? _____ COUNTY | TOWN

What county is that in? _____

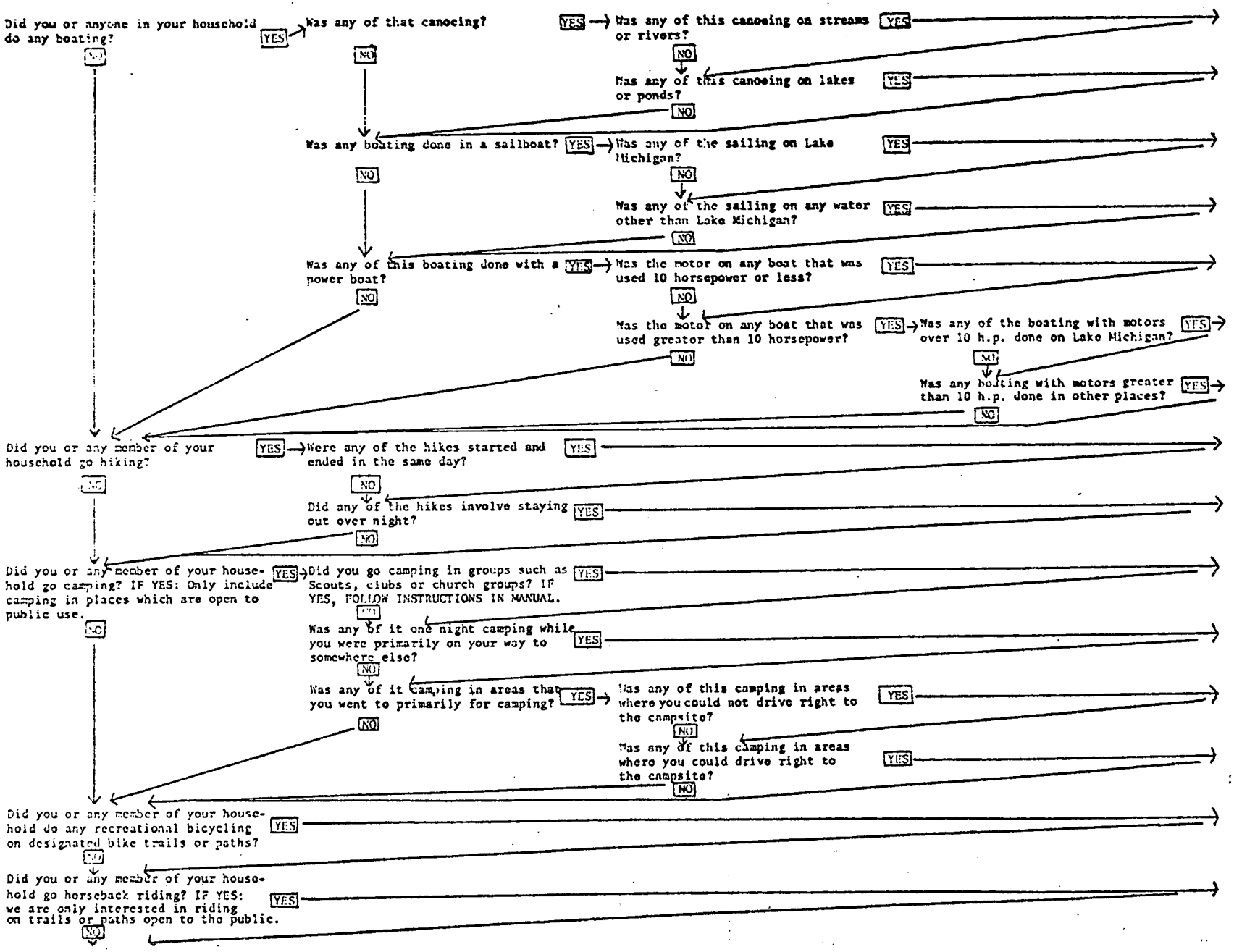
I would like to get an idea of who lives in your household.

ENUMERATE FOLLOWING INSTRUCTIONS IN INTERVIEWERS MANUAL

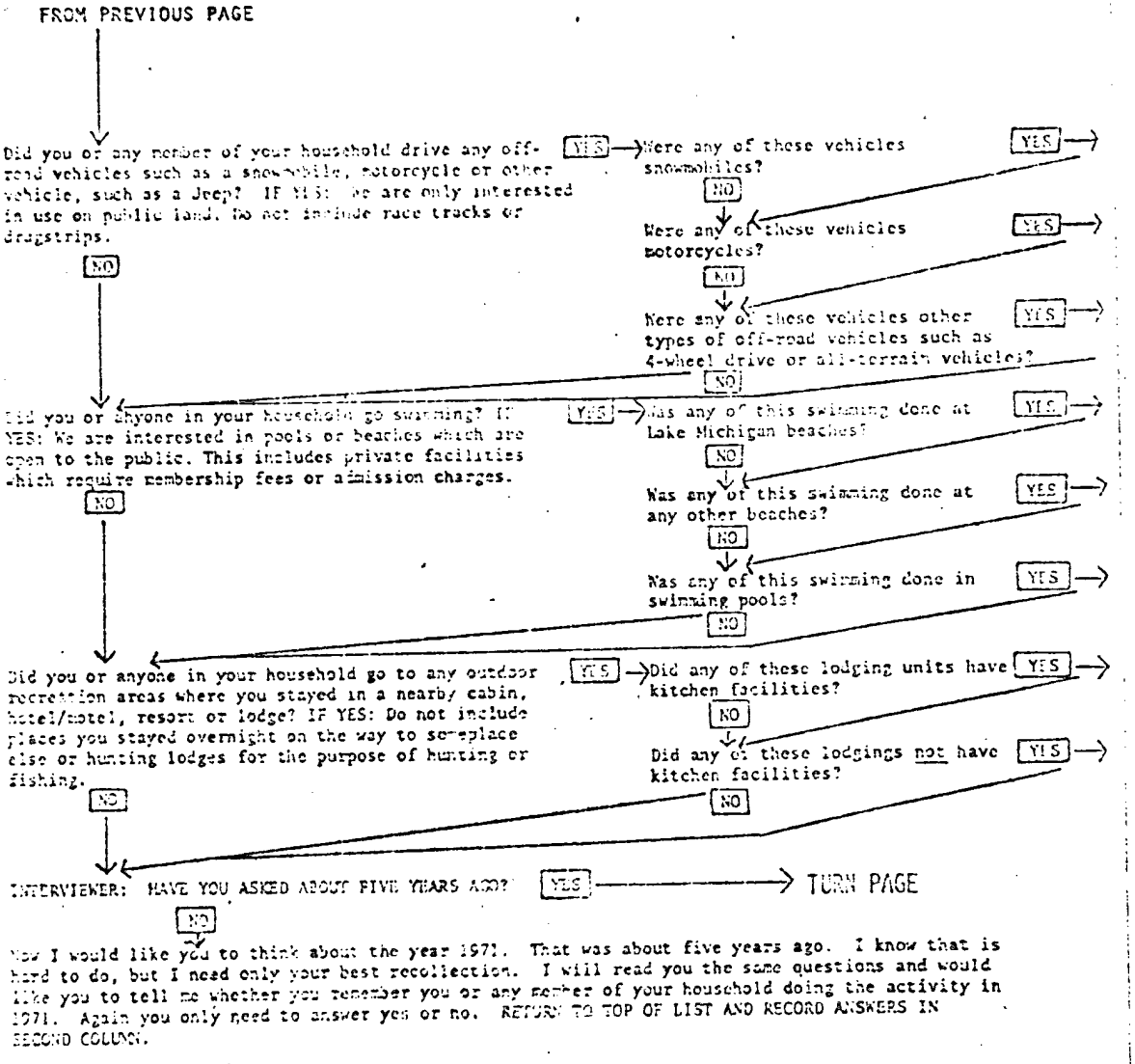
| PERSON | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RESPONDENT CHECK IF "YES" | y | y | y | y | y | y | y | y | y | y | y | y |
| RELATION head | h | h | h | h | h | h | h | h | h | h | h | h |
| cohead | c | c | c | c | c | c | c | c | c | c | c | c |
| spouse | s | s | s | s | s | s | s | s | s | s | s | s |
| unmarried child | u | u | u | u | u | u | u | u | u | u | u | u |
| married child | m | m | m | m | m | m | m | m | m | m | m | m |
| relative | r | r | r | r | r | r | r | r | r | r | r | r |
| not related | n | n | n | n | n | n | n | n | n | n | n | n |
| SEX male | m | m | m | m | m | m | m | m | m | m | m | m |
| female | f | f | f | f | f | f | f | f | f | f | f | f |
| NOTES AGE | 0 1 2 3 4 5 6 7 8 9 | 0 1 2 3 4 5 6 7 8 9 | 0 1 2 3 4 5 6 7 8 9 | 0 1 2 3 4 5 6 7 8 9 | 0 1 2 3 4 5 6 7 8 9 | 0 1 2 3 4 5 6 7 8 9 | 0 1 2 3 4 5 6 7 8 9 | 0 1 2 3 4 5 6 7 8 9 | 0 1 2 3 4 5 6 7 8 9 | 0 1 2 3 4 5 6 7 8 9 | 0 1 2 3 4 5 6 7 8 9 | 0 1 2 3 4 5 6 7 8 9 |

OPTICAL SCANNING CORPORATION

Now I would like to ask you about the kinds of outdoor recreation activities you and other people in your household have engaged in during the last year. Think back over the period since about one year ago today. I will ask you a few questions. You only need to answer yes or no -- yes if you or any member of your household has done the activity in the last year -- no if no one has done it.




| LAST YEAR | 1971 | MORE THAN 1971? |
|---|---|---|
| y | y | m s l |
| y | y | m s l |
| y | y | m s l |
| y | y | m s l |
| y | y | m s l |
| y | y | m s l |
| y | y | m s l |
| y | y | m s l |
| y | y | m s l |
| y | y | m s l |
| y | y | m s l |
| y | y | m s l |
| y | y | m s l |


FROM PREVIOUS PAGE
Did you or any member of your household drive any off-road vehicles such as a snowmobile, motorcycle or other vehicle, such as a Jeep? IF YES: We are only interested in use on public land. Do not include race tracks or dragstrips.
YES
Were any of these vehicles snowmobiles?
NO
Were any of these vehicles motorcycles?
NO
Were any of these vehicles other types of off-road vehicles such as 4-wheel drive or all-terrain vehicles?
NO
Did you or anyone in your household go swimming? IF YES: We are interested in pools or beaches which are open to the public. This includes private facilities which require membership fees or admission charges.
YES
Was any of this swimming done at Lake Michigan beaches?
NO
Was any of this swimming done at any other beaches?
NO
Was any of this swimming done in swimming pools?
NO
Did you or anyone in your household go to any outdoor recreation areas where you stayed in a nearby cabin, hotel/motel, resort or lodge? IF YES: Do not include places you stayed overnight on the way to someplace else or hunting lodges for the purpose of hunting or fishing.
YES
Did any of these lodging units have kitchen facilities?
NO
Did any of these lodgings not have kitchen facilities?
NO
INTERVIEWER: HAVE YOU ASKED ABOUT FIVE YEARS AGO?
YES
TURN PAGE
NO
Now I would like you to think about the year 1971. That was about five years ago. I know that is hard to do, but I need only your best recollection. I will read you the same questions and would like you to tell me whether you remember you or any member of your household doing the activity in 1971. Again you only need to answer yes or no. RETURN TO TOP OF LIST AND RECORD ANSWERS IN SECOND COLUMN.

| SERIAL | SUP |
|---|---|
| 0 0 0 0 0 | 0 0 0 |
| 1 1 1 1 1 | 1 1 1 |
| 2 2 2 2 2 | 2 2 2 |
| 3 3 3 3 3 | 3 3 3 |
| 4 4 4 4 4 | 4 4 4 |
| 5 5 5 5 5 | 5 5 5 |
| 6 6 6 6 6 | 6 6 6 |
| 7 7 7 7 7 | 7 7 7 |
| 8 8 8 8 8 | 8 8 8 |
| 9 9 9 9 9 | 9 9 9 |

NOTES

| | LAST YEAR | 1971 | MORE THAN 1971? |
|---|---|---|---|
| p Snowmobiling | y | y | m s l |
| q Off-road Motor-Motorcycling | y | y | m s l |
| r Off-road Driving | y | y | m s l |
| s Swimming at Lake Michigan | y | y | m s l |
| t Beach Swimming Not at Lake Michigan | y | y | m s l |
| u Swimming at Pools | y | y | m s l |
| v Lodging With Kitchen Facilities | y | y | m s l |
| w Lodging Without Kitchen Facilities | y | y | m s l |

INTERVIEWER: FOR EVERY ACTIVITY DONE LAST YEAR AND FIVE YEARS AGO:

For both last year and five years ago you answered yes to (READ WORDING OF QUESTION). Would you say that you did that more last year than five years ago or less or about the same?

RECORD ANSWERS IN THIRD COLUMN.

| | LAST YEAR | 1971 | MORE THAN 1971? |
|---|---|---|---|
| a Canoeing on Streams Or Rivers | y | y | m s l |
| b Canoeing on Lakes Or Ponds | y | y | m s l |
| c Sailing On Lake Michigan | y | y | m s l |
| d Sailing Except On Lake Michigan | y | y | m s l |
| e Motorboating With 10 hp. or Less | y | y | m s l |
| f Motorboating On Lake Michigan | y | y | m s l |
| g Motorboating With Greater Than 10 hp. | y | y | m s l |
| h Day Hiking | y | y | m s l |
| i Overnight Hiking | y | y | m s l |
| j Camping With An Organized Group | y | y | m s l |
| k Camping On the Way To Somewhere Else | y | y | m s l |
| l Camping In Places You Couldn't Drive To | y | y | m s l |
| m Camping In Places You Could Drive To | y | y | m s l |
| n Bicycling For Recreation | y | y | m s l |
| o Horseback Riding | y | y | m s l |

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RECORD

You said that people in your
Can you tell me how many different [illegible] people in your household
On the average, how many people (*) each time?

| ACTIVITY | DAYS | PEOPLE | NOTES | SUF | PLACE 1 | PLACE 2 | SERIAL |
|---|---|---|---|---|---|---|---|
| a k u | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| b l v | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| c m w | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| d n x | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| e o y | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| f p z | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| g q | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| h r | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| i s | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| j t | 9 | 9 | 9 | 9 | 9 | 9 | 9 |

Where did you go most frequently to (*)? RECORD VERBATIM AND ASK:
About how far is that from where you live?
About how long does it take to get there?
How many different days did you go there to (*)?
On the average, how many people went there to (*) each time?

Where did you go next most frequently to (*)? RECORD VERBATIM & ASK:
About how far is that from where you live?
About how long does it take to get there?
How many different days did you go there to (*)?
On the average, how many people went there to (*) each time?

| RECORD PLACE | DISTANCE | HOURS : MIN. | DAYS | PEOPLE |
|---|---|---|---|---|
| | 0 | 0 : 0 | 0 | 0 |
| | 1 | 1 : 1 | 1 | 1 |
| | 2 | 2 : 2 | 2 | 2 |
| | 3 | 3 : 3 | 3 | 3 |
| | 4 | 4 : 4 | 4 | 4 |
| | 5 | 5 : 5 | 5 | 5 |
| | 6 | 6 : 6 | 6 | 6 |
| | 7 | 7 : 7 | 7 | 7 |
| | 8 | 8 : 8 | 8 | 8 |
| | 9 | 9 : 9 | 9 | 9 |

| RECORD PLACE | DISTANCE | HOURS : MIN. | DAYS | PEOPLE |
|---|---|---|---|---|
| | 0 | 0 : 0 | 0 | 0 |
| | 1 | 1 : 1 | 1 | 1 |
| | 2 | 2 : 2 | 2 | 2 |
| | 3 | 3 : 3 | 3 | 3 |
| | 4 | 4 : 4 | 4 | 4 |
| | 5 | 5 : 5 | 5 | 5 |
| | 6 | 6 : 6 | 6 | 6 |
| | 7 | 7 : 7 | 7 | 7 |
| | 8 | 8 : 8 | 8 | 8 |
| | 9 | 9 : 9 | 9 | 9 |

Did people in your household go to any other places to (*) last year? IF NO GO TO NEXT REPORT.
IF YES: Can you tell me what they were? RECORD FIRST THREE MENTIONED VERBATIM AND ASK:
How many different days did you go there to (*)? On the average, how many people went there each time?

| RECORD PLACE | DAYS | PEOPLE |
|---|---|---|
| | 0 | 0 |
| | 1 | 1 |
| | 2 | 2 |
| | 3 | 3 |
| | 4 | 4 |
| | 5 | 5 |
| | 6 | 6 |
| | 7 | 7 |
| | 8 | 8 |
| | 9 | 9 |

| RECORD PLACE | DAYS | PEOPLE |
|---|---|---|
| | 0 | 0 |
| | 1 | 1 |
| | 2 | 2 |
| | 3 | 3 |
| | 4 | 4 |
| | 5 | 5 |
| | 6 | 6 |
| | 7 | 7 |
| | 8 | 8 |
| | 9 | 9 |

| RECORD PLACE | DAYS | PEOPLE |
|---|---|---|
| | 0 | 0 |
| | 1 | 1 |
| | 2 | 2 |
| | 3 | 3 |
| | 4 | 4 |
| | 5 | 5 |
| | 6 | 6 |
| | 7 | 7 |
| | 8 | 8 |
| | 9 | 9 |

GO TO NEXT ACTIVITY REPORT



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Now I would like to ask you some questions about your background.

IF RESPONDENT IS HOUSEHOLD HEAD OR COHEAD: Most of the questions are about you.
IF RESPONDENT IS NOT HOUSEHOLD HEAD OR COHEAD: Most of the questions are about the head of the household.

INTERVIEWER: CLEARLY ESTABLISH THAT YOU ARE TALKING ABOUT THE HOUSEHOLD HEAD OR COHEAD IN THE QUESTIONS THAT FOLLOW.

How many years have you (has he/she) lived at this address?

ENTER ACTUAL NUMBER OF YEARS, ROUNDED TO NEAREST YEAR (1/2 YEAR OR MORE ROUNDED UP).

---

How many years have you (has he/she) lived here in (NAME OF CITY OR TOWN)?

ENTER ACTUAL NUMBER OF YEARS, ROUNDED TO NEAREST YEAR (1/2 YEAR OR MORE ROUNDED UP).

---

IF LESS THAN ALL OF LIFE IN THIS AREA:

In what type of place did you (he/she) live before you (he/she) moved to (NAME OF CITY OR TOWN OF CURRENT RESIDENCE)? Which of these categories comes closest to the the type of place you were (he/she was) living before you (he/she) moved here? READ CATEGORIES:

In a large city (250,000+).....1
In a suburb near a large city.....2
In a medium-size city (50,000-250,000).....3
In a small city or town (under 50,000).....4
On a farm or ranch.....5
In open country but not on a farm.....6

---

IF LESS THAN ALL LIFE IN THIS AREA:

What type of place did you (he/she) live in when you were (he/she was) a child -- up to about 12 years old? READ CATEGORIES:

In a large city (250,000+).....1
In a suburb near a large city.....2
In a medium-size city (50,000-250,000).....3
In a small city or town (under 50,000).....4
On a farm or ranch.....5
In open country but not on a farm.....6

Do you (does he/she) currently have a job?

YES, FULL TIME.....1
YES, PART TIME.....1
AM LOOKING FOR EMPLOYMENT.....2
UNABLE TO WORK (ILLNESS, ETC.).....3
RETIRED.....4
MARRIED HOUSEWIFE.....5
OTHER.....6

---

IF NOT 0 OR 1 TO PREVIOUS QUESTION, SKIP TO OCCUPATION QUESTION AT BOTTOM OF THIS PAGE.

How many days do you (does he/she) work in an average week?

RECORD NUMBER OF DAYS

---

How many hours do you (does he/she) work in an average week?

RECORD NUMBER OF HOURS

---

How many days of paid vacation from your (his/her) job did you (he/she) have during the last year, not counting weekends and holidays?

RECORD NUMBER OF DAYS

---

IF HOUSEHOLD HEAD EVER WORKED:
What is (was) your (his/her) occupation?

FOLLOW INSTRUCTIONS TO INTERVIEWER TO COMPLETE BOXES AT RIGHT.

Are you (is he/she) now attending or enrolled in school?

IF YES: Is that full-time or part-time?

YES, FULL-TIME STUDENT.....1
YES, PART-TIME STUDENT.....2
NO.....3

---

What is the highest grade or year you (he/she) finished and got credit for in school or college?

ENTER TWO-DIGIT CODE FOR HIGHEST GRADE (YEAR) COMPLETED.

NO FORMAL SCHOOL.....00

| | | | |
|---|---|---|---|
| GRADE SCHOOL..01 | HIGH SCHOOL..09 | COLLEGE..13 | POST-COLLEGE.17 |
| 02 | 10 | 14 | 18 |
| 03 | 11 | 15 | 19 |
| 04 | 12 | 16 | 20+ |
| 05 | | | |
| 06 | | | |
| 07 | | | |
| 08 | | | |

---

Do you live in a house or an apartment or a mobile home?

HOUSE.....1
APARTMENT.....2
MOBILE HOME.....3

---

Do you (does your family) own this house (apartment/mobile home), are you buying it, do you pay rent, or what?

OWNED.....1
COOPERATIVE.....2
RENT.....3
NO PAYMENT.....4
OTHER.....5

IF NOT CLEARLY ESTABLISHED ABOVE ASK:

Are you (he/she) now married, widowed, divorced, separated, or have you (has he/she) never been married?

NOW MARRIED.....1
WIDOWED.....2
DIVORCED.....3
SEPARATED.....4
NEVER MARRIED.....5

OTHERWISE CODE WITHOUT ASKING.

---

What is your family's racial background or original national origin.

BLACK.....1
SPANISH AMERICAN.....2
OTHER.....3

---

Can you tell me approximately what your total household income was in 1975 before taxes?

UNDER $3,000.....a
$3,000 TO $3,999.....b
$4,000 TO $4,999.....c
$5,000 TO $5,999.....d
$6,000 TO $7,999.....e
$8,000 TO $9,999.....f
$10,000 TO $11,999.....g
$12,000 TO $14,999.....h
$15,000 TO $19,999.....i
$20,000 TO $24,999.....j
$25,000 TO $29,999.....k
$30,000 TO $34,999.....l
$35,000 AND OVER.....m

Some people participate in outdoor activities because it provides them with an opportunity to be with or meet new people, while others participate because it gives them a chance to get away from a lot of other people. Which of these reasons more closely describes your own reasons--to meet or be with others, or to get away.

MEET PEOPLE.....
GET AWAY.....
BOTH.....
NEITHER.....

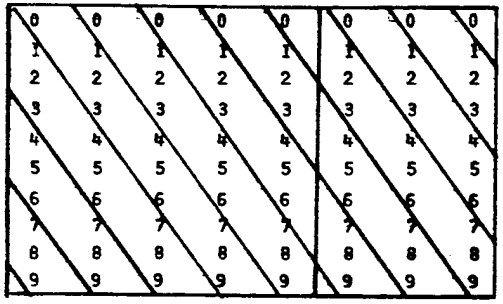
When the government designs a new recreational area, do you feel it is more important to preserve the area in its natural state as much as possible, or to develop the facilities and conveniences for people?

PRESERVE THE AREA...
DEVELOP FOR PEOPLE..
BOTH.....

When meeting new people, some people prefer to talk mainly about their work, while others prefer to talk mainly about their freetime activities. Which kind of person is more like you?

WORK.....
FREE TIME.....
BOTH.....
NEITHER.....

Thank you for talking to me, you have been very helpful. Is there anything you would like to add? Thanks again.




NOTES

OCCUPATION:

INDUSTRY

CLASS OF WORKER (CIRCLE):
SELF-EMPLOYED UNPAID
GOVERNMENT SALARIED

IF FARM (CIRCLE):
OWNER MANAGER TENANT
FOREMAN LABORER



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# APPENDIX B

# SCORP 1976 INVENTORY OF LANDS AND FACILITIES[1]
## SOUTHERN ILLINOIS UNIVERSITY-CARBONDALE

1. Name of Person Completing Inventory_____ Title_____

2. Agency/Organization_____ Phone_____

   Address_____ Zip_____

| 3. Name of Area(s) | Location (nearest City) | County | Acreage (Land & Water) |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
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| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

[1]The inventory form should only be completed if your area is open to the public or your membership is open to the public. This includes privately owned areas opened to the public for a fee, clubs with memberships open to the public for a fee, etc.; but excludes clubs or organizations open only to a select group, e.g., cooperative homeowners' associations, etc.

1. DESIGNATED CAMPING AREAS
   (Tents, Recreation Vehicles, Etc.; Not Cabins)

| | No. of Sites/Units |
|---|---|
| Fully Developed (Vehicular Access, Showers, Flush Toilets, Electricity) | |
| Partially Developed (Vehicular Access, With One Or More Of The Following: Showers, Flush Toilets, Or Electricity) | |
| Primitive (Vehicular Access, Pit Toilets) | |
| Walk-In (No Vehicular Access, Facilities Vary) | |
| Back Country (More Than 1/2 Mile From Point Of Access, Facilities Vary) | |

| | No. of Groups |
|---|---|
| GROUP (Areas Designed For Use By Organized Groups) | |

2. PICNIC AREAS

| | No. |
|---|---|
| Picnic Tables | |
| Picnic Shelters | |

3. DESIGNATED SWIMMING AREAS

| | No. | Sq. Ft. | Linear Ft. |
|---|---|---|---|
| Beaches | | N.A. | |
| Pools | | | N.A. |

4. BOATING AND FISHING WATERS
(Adjacent To Or Within Area)

| | Lakes/Ponds | | Rivers/Streams | | |
|---|---|---|---|---|---|
| | No. | Surface Acres | No. | Total Length (Mi.) | Ave. Width (Ft.) |
| Total (One Or More Activities Below) | | | | | |
| Unrestricted Waters (Motors Over 10 h.p.) | | | | | |
| Restricted Waters: | | | | | |
| Motors Under 10 h.p. & Electric Trolling | | | | | |
| Non-Motors Only | | | | | |
| Sailing Allowed[1] | | | | | |
| Canoeing Allowed[1] | | | | | |
| Fishing Allowed[1] | | | | | |

[1]Includes areas which have been listed under Total. We expect many areas will be used for several activities. Therefore, double counting is expected.

| | No. of Lanes |
|---|---|
| Launching Ramps | |
| | **No. of Slips** |
| Mooring Capacity | |
| | **No.** |
| Canoe Access Points (Rivers/Streams) | |

List water bodies outside area that are used by your patrons

_____

5. DESIGNATED OFF-ROAD VEHICLE (ORV) AREAS

| | Trails/Roads | | Areas | |
|---|---|---|---|---|
| | No. | Miles | No. | Acres |
| Total (One Or More Activities Below) | | | | |
| Motorcycles Allowed[1] | | | | |
| Snowmobiles Allowed[1] | | | | |
| 4 Wheel Drive & All Terrain Allowed[1] | | | | |
| Mixed/Other Types (Please Specify_____) | | | | |

[1]Includes areas which have been listed under Total. We expect many areas will be used for several activities. Therefore, double counting is expected.

6. TRAILS

| | No. | Miles |
|---|---|---|
| Total (One Or More Of Activities Below) | ___ | ___ |
| Primarily Or Exclusively Day Use | ___ | ___ |
| Primarily Or Exclusively Backpacking (Overnight Use) | ___ | ___ |
| Nature (Interpretive) | ___ | ___ |
| Horse Back Riding Allowed[1] | ___ | ___ |
| Bicycling Allowed[1] | ___ | ___ |

7. LODGING (On Site Only)

| | No. Units | No. Units Kitchens |
|---|---|---|
| Lodges, Hotels | ___ | ___ |
| Cabins | ___ | ___ |

[1]Includes areas which have been listed under Total. We expect many areas will be used for several activities. Therefore, double counting is expected.

8. What percent changes (positive, negative) to the stated supplies of each reported activity do you have programmed for the next five years. (For example, will your capacity for fully developed camping areas remain the same, increase 20 percent, etc.).

| | PERCENT CHANGE 5 YEARS |
|---|---|
| DESIGNATED CAMPING AREAS | |
| Fully Developed | _____ |
| Partially Developed | _____ |
| Primitive | _____ |
| Walk-In | _____ |
| Back Country | _____ |
| Group | _____ |
| PICNIC AREAS | |
| Picnic Tables | _____ |
| Picnic Shelters | _____ |
| DESIGNATED SWIMMING AREAS | |
| Beaches | _____ |
| Pools | _____ |

8. (Continued)

| | PERCENT CHANGE 5 YEARS |
|---|---|
| BOATING AND FISHING WATERS | |
| **Total** | _____ |
| Unrestricted Waters | _____ |
| Restricted Waters: | |
| Motors Under 10 h.p. & Electric Trolling | _____ |
| Non-Motors Only | _____ |
| Sailing | _____ |
| Canoeing | _____ |
| Fishing | _____ |
| Launching Ramps | _____ |
| Mooring Capacity | _____ |
| Canoe Access Points | _____ |
| DESIGNATED OFF-ROAD VEHICLE (ORV) AREAS | |
| Total | _____ |
| Motorcycles | _____ |
| Snowmobiles | _____ |
| 4 Wheel Drive & All Terrain | _____ |
| Mixed/Other Types | _____ |

# APPENDIX C

## Definitions of Variables

PCMale = Percentage Male in a household

Avage = Average age of the household

Child 0-2 = Number of children in the household between 0 and 2 years of age.

Child 3-5 = Number of children in the household between 3 and 5 years of age.

Child 6-12 = Number of children in the household between 6 and 12 years of age.

Child 13-17 = Number of children in the household between 13 and 17 years of age.

Addyrs = Length of residence at current address in years

Twnyrs = Length of residenc in current town of residence to nearest half year

Chtwnsiz* = The size of town in which the respondet lived between 0 and 12 years of age

Wkhrs = The number of work hours of the household in a work week

Vacdays - The number of paid vacation/holidays per year

Distance = The distance (in miles) to recreation destinations

Hrmin - The travel time (in minutes) to recreation destinations

*See Appendix A for coding of this question

Day Hiking - 1976

| | State | HDSA Area |
|---|---|---|
| PCMA | .4766 | .4876 |
| Avage | 28.8485 | 28.7424 |
| Child 0-2 | .1046 | .1308 |
| Child 3-5 | .1921 | .2236 |
| Child 6-12 | .5610 | .7103 |
| Child 13-17 | .3882 | .4299 |
| Addyrs | 19.2108 | 24.5981 |
| Twnyrs | 36.6875 | 43.4206 |
| Chtwnsiz | 4.8030 | 5.4486 |
| Wkhrs | 47.4509 | 44.3551 |
| Vacdays | 22.6650 | 16.5607 |
| Dist | 148.1538/40.1467 | 121.7757/45.8333 |
| Hrmin | 182.5835/65.7523 | 169.4112/66.3000 |

Overnight Camping -1976

| | State | HDSA Area |
|---|---|---|
| PCMale | .5087 | .4568 |
| Avage | 26.3032 | 30.5873 |
| Child 0-2 | .0723 | .1364 |
| Child 3-5 | .1181 | .1364 |
| Child 6-12 | .6082 | .6364 |
| Child 13-17 | .5181 | .5909 |
| Addyrs | 18.4482 | 27.8182 |
| Twnyrs | 36.4843 | 53.0309 |
| Chtwnsiz | 4.6675 | 5.7727 |
| Wkhrs | 45.8024 | 42.5909 |
| Vacdays | 22.2120 | 12.1364 |
| Dist | 241.2657/39.0455 | 128.9545/39.0000 |
| Hrmin | 310.5783/70.0995 | 131.0000/43.0000 |

Camping With An Organized Group - 1976

| | State | HDSA Area |
|---|---|---|
| PCMale | .4581 | .3988 |
| Avage | 26.3252 | 25.5228 |
| Child 0-2 | .0873 | .0400 |
| Child 3-5 | .1616 | .2400 |
| Child 6-12 | .9054 | .8800 |
| Child 13-17 | .6972 | .5600 |
| Addyrs | 19.2576 | 21.0800 |
| Twnyrs | 37.5735 | 46.3600 |
| Chtwnsiz | 4.7598 | 5.0400 |
| Wkhrs | 46.3901 | 46.5600 |
| Vacdays | 20.0815 | 21.9600 |
| Dist | 112.1921/48.5313 | 63.4000/105.0000 |
| Hrmin | 149.7555/59.8828 | 58.4400/102.3333 |

## Camping Enroute - Transient - 1976

| | State | HDSA Area |
|---|---|---|
| PCMale | .4914 | .4490 |
| Avage | 29.5719 | 27.0477 |
| Child 0-2 | .1103 | .1667 |
| Child 3-5 | .1813 | .2333 |
| Child 6-12 | .4668 | .7667 |
| Child 13-17 | .3610 | .5667 |
| Addyrs | 20.3323 | 20.9667 |
| Chtwnsiz | 4.7130 | 5.000 |
| Wkhrs | 48.3968 | 52.5333 |
| Vacdays | 23.9109 | 20.4333 |
| Dist | 343.6435/114.6964 | 290.7000/70.0000 |
| Hrmin | 451.2372/129.7857 | 375.0000/75.0000 |

Primitive Camping - Cannot Drive In - 1976

| | State | HDSA Area |
|---|---|---|
| PCMale | .4863 | .5040 |
| Avage | 27.9298 | 27.5886 |
| Child 0-2 | .1118 | .1045 |
| Child 3-5 | .1938 | .2015 |
| Child 6-12 | .5088 | .5522 |
| Child 13-17 | .3963 | .3955 |
| Addyrs | 19.4853 | 29.6567 |
| Twnyrs | 38.8588 | 44.0821 |
| Chtwnsiz | 4.8024 | 5.3433 |
| Wkhrs | 47.3011 | 44.9254 |
| Vacdays | 22.2188 | 20.7985 |
| Dist | 194.5874/57.8338 | 203.7090/66.2857 |
| Hrmin | 240.7068/77.5659 | 268.9403/83.5714 |

## Camping You Can Drive Into - 1976

| | State | HDSA Area |
|---|---|---|
| PCMale | .5084 | .5045 |
| Avage | 26.9459 | 29.9490 |
| Child 0-2 | .1061 | .2000 |
| Child 3-5 | .1245 | .2500 |
| Child 6-12 | .4510 | .6500 |
| Child 13-17 | .4694 | .6000 |
| Addyrs | 18.6959 | 26.7000 |
| Twnyrs | 36.5816 | 48.5000 |
| Chtwnsiz | 4.8102 | 5.5000 |
| Wkhrs | 47.3061 | 47.3000 |
| Vacdays | 20.8061 | 15.3000 |
| Dist | 261.5531/67.5823 | 227.6000 |
| Hrmin | 319.3592/87.0883 | 312.5000 |

## Recreational Bicycling - 1976

| | State | HDSA Area |
|---|---|---|
| PCMale | .4640 | .4573 |
| Avage | 26.7772 | 27.2620 |
| Child 0-2 | .1090 | .1091 |
| Child 3-5 | .1701 | .2364 |
| Child 6-12 | .5074 | .7273 |
| Child 13-17 | .4602 | .5455 |
| Addyrs | 18.6981 | 25.2545 |
| Twnyrs | 34.4161 | 40.3273 |
| Chtwnsiz | 5.2688 | 5.3273 |
| Wkhrs | 46.3675 | 39.5818 |
| Dist | 43.8999/12.0799 | 9.0909/20.3333 |
| Hrmin | 79.9772/45.3314 | 21.2545/25.0833 |

## Horseback Riding - 1976

| | State | HDSA Area |
|---|---|---|
| PCMale | .4532 | .3764 |
| Avage | 26.6018 | 29.2725 |
| Child 0-2 | .0902 | .0714 |
| Child 3-5 | .1697 | .3214 |
| Child 6-12 | .5349 | .4286 |
| Child 13-17 | .5596 | .4643 |
| Addyrs | 18.9151 | 21.8214 |
| Twnyrs | 36.2965 | 41.5714 |
| Chtwnsiz | 4.5188 | 4.9643 |
| Wkhrs | 48.2707 | 49.3571 |
| Vacdays | 21.2052 | 16.0357 |
| Dist | 141.8733/40.1455 | 140.3929/35.2727 |
| Hrmin | 182.6284/86.4000 | 160.5000/35.0000 |

Beach Swimming not at Lake Michigan - 1976

| | State | HDSA Area |
|---|---|---|
| PCMale | .4805 | .5045 |
| Avage | 27.0253 | 28.6273 |
| Child 0-2 | .1250 | .1212 |
| Child 3-5 | .1977 | .2500 |
| Child 6-12 | .5120 | .6515 |
| Child 13-17 | .4402 | .4091 |
| Addyrs | 18.4959 | 26.8939 |
| Twnyrs | 37.7122 | 45.2727 |
| Chtwnsiz | 4.7207 | 4.6364 |
| Wkhrs | 47.1047 | 43.9242 |
| Vacdays | 21.5084 | 18.8788 |
| Dist | 229.1190/46.1807 | 190.5152/67.4186 |
| Hrmin | 252.5102/66.1332 | 220.4924/70.5814 |

## Swimming at Pools - 1976

| | State | HDSA Area |
|---|---|---|
| PCMale | .4680 | .4516 |
| Avage | 26.4566 | 28.3427 |
| Child 0-2 | .1268 | .1143 |
| Child 3-5 | .1937 | .2143 |
| Child 6-12 | .6181 | .6714 |
| Child 13-17 | .5355 | .5429 |
| Addyrs | 19.2657 | 23.7000 |
| Twnyrs | 38.3524 | 42.5643 |
| Chtwnsiz | 4.7390 | 5.4071 |
| Wkhrs | 47.7594 | 45.6714 |
| Vacdays | 22.1699 | 23.8000 |
| Dist | 66.2349/10.0240 | 63.8643/4.6000 |
| Hrmin | 75.9460/23.1409 | 55.4857/9.2800 |

## Lodging with Kitchen Facilities - 1976

| | State | HDSA Area |
|---|---|---|
| PCMale | .4681 | .4417 |
| Avage | 33.2270 | 30.9279 |
| Child 0-2 | .0895 | .0690 |
| Child 3-5 | .1456 | .1034 |
| Child 6-12 | .4246 | .4824 |
| Child 13-17 | .3897 | .4655 |
| Addyrs | 23.4123 | 25.4310 |
| Twnyrs | 38.5158 | 42.7414 |
| Chtwnsiz | 4.5439 | 5.3448 |
| Wkhours | 48.1289 | 44.1207 |
| Vacdays | 24.9132 | 21.7414 |
| Dist | 406.7105/80.1356 | 319.5517/90.00 |
| Hrmin | 474.9123/100.3220 | 401.8793/100.00 |

Canoe - Lakes & Ponds - 1976

| | State | HDSA Area* |
|---|---|---|
| PCMale | .5315 | .3864 |
| Avage | 29.3676 | 32.7573 |
| Child 0-2 | .0802 | .0000 |
| Child 3-5 | .1034 | .0000 |
| Child 6-12 | .5084 | .3636 |
| Child 13-17 | .4451 | .0909 |
| Addyrs | 18.1772 | 24.9091 |
| Twnyrs | 37.1266 | 52.4545 |
| Chtwnsiz | 5.0000 | 7.1818 |
| Wkhrs | 47.4219 | 43.8142 |
| Vacdays | 21.6477 | 8.3636 |
| Dist | 188.1013/46.8627 | 177.2727/55.0000 |
| Hrmin | 201.5865/64.2745 | 186.3636/60.0000 |

*Only one household in East St. Louis HDSA Area

Snowmobiling - 1976**

| | State | HDSA Area* |
|---|---|---|
| PCMALE | .5057 | .2500 |
| Avage | 27.0023 | 29.7500 |
| Child 0-2 | .1408 | .0000 |
| Child 3-5 | .1606 | .0000 |
| Child 6-12 | .3662 | .0000 |
| Child 13-17 | .3915 | .6667 |
| Addyrs | 19.0789 | 21.3333 |
| Twnyrs | 37.5972 | 47.6667 |
| Chtwnsiz | 4.5887 | 7.0000 |
| Wkhrs | 46.6113 | 29.3333 |
| Vacdays | 18.6817 | .3333 |
| Dist | 120.0113/55.1818 | 740.0000/ |
| Hrmin | 158.8704/68.2500 | 720.0000/ |

*Urban areas of St. Clair and Madison Counties

**Small Sample Sizes in Study Areas

Off-Road Driving - 1976**

| | State | HDSA Area* |
|---|---|---|
| PCMale | .5006 | .5460 |
| Avage | 26.6269 | 31.8710 |
| Child 0-2 | .1760 | .2000 |
| Child 3-5 | .1803 | .2000 |
| Child 6-12 | .4421 | .2000 |
| Child 13-17 | .3133 | .5000 |
| Addyrs | 21.1631 | 32.3000 |
| Twnyrs | 41.0987 | 39.3000 |
| Chtwnsiz | 4.8369 | 4.4000 |
| Wkhrs | 49.2704 | 48.8000 |
| Vacdays | 22.2532 | 26.2000 |
| Dist | 129.1245/29.3182 | 240.6000/93.3333 |
| Hrmin | 129.7811/41.5909 | 320.3000/110.0000 |

*Urban areas of Madison and St. Clair Counties

**Small Sample Sizes in Study Areas

Sailing Except Lake Michigan - 1976**

| | State | HDSA Area |
|---|---|---|
| PCMale | .4608 | .3617 |
| Avage | 27.8293 | 26.8350 |
| Child 0-2 | .0960 | .0000 |
| Child 3-5 | .1176 | .6667 |
| Child 6-12 | .3808 | .1667 |
| Child 13-17 | .4768 | .8000 |
| Addyrs | 17.2879 | 26.0000 |
| Twnyrs | 31.9102 | 53.8333 |
| Chtwnsiz | 5.0929 | 5.6667 |
| Wkhrs | 47.2477 | 40.3333 |
| Vacdays | 23.4954 | 15.6667 |
| Dist | 181.7307/32.3519 | 1544.3300 |
| Hrmin | 180.0650/44.5556 | 430.0000 |

**Small Sample Sizes in Study Areas

Sailing on Lake Michigan - 1976

| | State |
|---|---|
| PCMale | .4943 |
| Avage | 26.2063 |
| Child 0-2 | .1096 |
| Child 3-5 | .0753 |
| Child 6-12 | .3973 |
| Child 13-17 | .3904 |
| Addyrs | 16.3151 |
| Twnyrs | 30.8767 |
| Chtwnsiz | 4.3904 |
| Wkdays | 1.1027 |
| Wkhrs | 47.6575 |
| Vacdays | 23.6438 |
| Dist | 75.3562/44.1489 |
| Hrmin | 84.4726/56.1702 |

Swimming at Lake Michigan - 1976

| | State |
|---|---|
| PCMale | .4663 |
| Avage | 26.4181 |
| Child 0-2 | .0907 |
| Child 3-5 | .1695 |
| Child 6-12 | .4696 |
| Child 13-17 | .5006 |
| Addyrs | 19.8473 |
| Twnyrs | 30.6248 |
| Chtwnsiz | 4.9961 |
| Wkdays | 1.0724 |
| Wkhrs | 46.0103 |
| Vacdays | 22.1009 |
| Dist | 69.1255/ |
| Hrmin | 90.2109/ |